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Too busy working, or maybe partying, over New Year's to have kept tabs on Y2K? Recap the millennium rollover on our Y2K Watch home page (*www.computerworld.com/y2kwatch*), where you'll find stories about your peers, global reports, a forum, QuickPoll results, editorials on the fallout, legal and post-Y2K advice, links to archived stories and resources, and scads of facts and trivia. Questions? Tips? Reports of lingering problems? Contact us at y2kwatch@computerworld.com.

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E-RETAILERS LEARN DELIVERY LESSON

Setting expectations key; delays singe Toys R Us

BY DAVID ORENSTEIN

Toys R Us Inc. was one of many retailers this holiday season that learned heavy Web site traffic can make high expectations hard to fulfill all the time.

On Dec. 22, the company found itself e-mailing "a small percentage" of its mammoth volume of customers to tell them that they might not receive in time for **E-SHOPPING** Christmas the merchandise they ordered almost two weeks earlier. A Toysrus.com spokesman said that the company faced overwhelming demand online and that it would give $100 gift certificates to shoppers who spent Christmas without their ordered toys.

Retailers are still learning how to properly meet and manage customer expectations about the fulfillment of e-commerce orders.

In particular, they're learning that providing realistic delivery information is a key component of keeping buyers happy, even if merchandise won't arrive right away, according to a study by Andersen Consulting in Chicago.

But before Andersen could measure how electronic retailers performed logistically, it found that a quarter of the purchases — 130 out of 480 — that its supply-chain consultants tried to make couldn't be completed because sites had crashed or were somehow blocked. Andersen had 25 employees visit 100 Web sites between Dec. 3 and 10 to conduct the test.

E-Retailing, page 16

SHIPPERS DECRY NEW RAIL MERGER

Owners: Common IT makes delays unlikely

BY LINDA ROSENCRANCE

Still stinging from two recent disastrous railroad mergers, rail shippers and federal officials say they fear the proposed merger and subsequent integration of the information technology systems of Canadian National Railway Co. and Burlington Northern Santa Fe Corp. will result in more costly delays and service disruptions.

However, the railroad companies expressed confidence that there would be minimal disruption, because they both use the same type of computer system.

On Track?

Owners of what will be North American Railways cite these merger benefits:

EFFICIENCIES
- More direct routes
- Faster transit times
- Bypassed bottlenecks
- Greater port access

COMMERCIAL BENEFITS
- Production and consumption regions linked
- Access to new markets

On Dec. 20, Canadian National in Montreal and Burlington Northern in Fort Worth, Texas, announced their proposed $19 billion merger. The company created by the merger, Montreal-based North American Railways, would be the largest line on the continent.

Railroad Merger, page 12

AUDIT OF H-1B VISA MISCOUNT DUE THIS MONTH

Feds may still take 1999 surplus from 2000 cap

BY JULEKHA DASH

Auditors from Big Five accounting firm KPMG International will continue to spend time this week at the Immigration and Naturalization Service's visa processing centers, trying to determine how many extra H-1B visas the INS may have granted in fiscal 1999.

The INS said it hasn't ruled out the possibility of deducting additional visas that were granted in fiscal 1999 from the 115,000-visa cap for fiscal 2000 — a move that remains the subject of heated debate.

"At this point, we're holding off on decisions on what to do with the overage until we have the number of [the] overage," said INS spokeswoman Eyleen Schmidt.

KPMG is expected to an-

H-1B Miscount, page 16

KEITH BERGMAN, an IT manager at Alliant Aerospace, says he's preparing for a slew of employees to arrive this week expecting IT support for the Palm-like devices they got as holiday gifts

LANCE CLAYTON

IT AGENDA 2000

WEARY OF TOP 100 LISTS AND VISIONARY fluff? Here's a year-end report that's ultrapractical. It identifies technology initiatives that ought to be on your agenda this year — from keeping hackers out of your Web site to preparing for a flood of handheld devices. *Special Report begins after page 36.*

ALSO: Columnist Jim Champy lays out the '00 agenda of CEOs. They'll put more pressure on IT departments, have no patience for system delays and be far less tolerant of clumsy technologies. *Page 89*

NEWSPAPER

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A BUSINESS iBOOK?

Although Apple Computer is still on the fringes of the corporate mainstream, our reviewer finds its inexpensive new iBook portable makes a handy and useful business tool.
Page 103

COMPUTERWORLD THIS WEEK

JANUARY 3, 2000

OPINIONS

> IT'S LIKE JOINING A CULT, WORKING AS IF IT'S A MATTER OF LIFE AND DEATH.

BILL LESSARD, ON WHY HE DESCRIBES WORKERS AT INTERNET START-UPS AS "NET SLAVES" IN HIS NEW BOOK.
SEE PAGE 89.

Seven More Suits Against Microsoft

Seven more federal class-action antitrust cases were filed against Microsoft Corp. the week of Dec. 20. All of the plaintiffs claim Microsoft hurt them by routinely overcharging for Windows software. These suits - one each in Charleston, S.C., Cincinnati, Milwaukee, Minneapolis and West Palm Beach, Fla., and two in Detroit - join at least 10 similar suits brought since Nov. 5. That's when U.S. District Court Judge Thomas Penfield Jackson declared Microsoft a monopoly. Microsoft has said the suits are "baseless."

More IT Pros Get Signing Bonuses

A survey by Robert Half International Inc. in Stamford, Conn., shows that a growing number of firms offer signing bonuses to information technology employees and managers. Of the CIOs polled, 36% said they offer signing bonuses to both staff and management candidates.

Hackers Join New Anti-Child Porn Group

A group of network security experts and hackers last month started Condemned.org to eradicate child pornography on the Internet. As of Dec. 21, the group had taken down more than 20 Internet-connected servers that were hosting allegedly illegal images of children, according to organizers.

Short Takes

MICROSOFT said its Exchange 2000 Server won't be widely available until the second half of the year, six months after the planned release of Windows 2000. . . . IBM filed a lawsuit claiming EMC CORP. breached a storage patent cross-licensing agreement that IBM said was to include DATA GENERAL CORP. technologies acquired by EMC last year. An EMC spokesman called the suit "frivolous.". . . THE WHITE HOUSE plans to create a portal to access government information. It will also require federal agencies to put the forms of the top 500 government services online.

Asia-Pacific Users Were Set for Y2K

U.S. companies overseas used experiences of typhoons, earthquakes to get ready

BY PATRICK THIBODEAU

U.S.-BASED companies operating in distant and relatively isolated regions of the world were among the first to experience the new year and any year 2000 problems. But for some of these companies, with offices and plants in places such as Vietnam and Guam, being prepared for extreme problems is a way of life.

Guam, whose motto is "Where America's Day Begins," was the first U.S. land to see the new year. The island, a seven-hour flight from Hawaii, is just over the international date line and 15 hours ahead of New York.

Before New Year's, information technology workers on the island said the systems they use to protect themselves from typhoons and earthquakes — like the quake that struck last month that measured 6.1 on the Richter scale — had them in good shape for Y2K.

"We have backup water, power, and we also have wireless backup of communications," said Ron Schnabel, the information systems director for DFS Group LP's Pacific region. The San Francisco-based retail chain has duty-free shops throughout the Pacific Rim and is Guam's largest private employer. "We're more protected than any other region," he said.

Because Guam was to see the new year first, Schnabel's operations were to serve as a benchmark for DFS's retail systems throughout Asia.

Other DFS systems weren't going to resume operations until Guam's retail systems were checked for any post-Y2K problems, a process that was expected to take five hours, Schnabel said.

Government-run power and water systems were expected to work, but if anything went wrong, Guam would have been on its own. "We have to be self-sufficient," said Dan Sanders, the information systems manager at Mid-Pacific Liquor Distributing Corp. But that company's systems are already "very hardened" to withstand power outages and fluctuations caused by typhoons and earthquakes, he said.

Early Payday

In Vietnam, Ford Motor Co., which operates a manufacturing plant outside of Hanoi, paid workers early in case bank financial systems failed.

Though Vietnam isn't as computerized as other countries, "there is still some nervousness in regard to banking," said Deborah Aronson, the general director of a Ford plant near Hanoi.

The government was expected to close banks in Vietnam Dec. 31 and on New Year's Day, though they are normal workdays in Vietnam. (The Vietnamese new year is celebrated during Tet, about a month later.) Aronson said she planned to withdraw a little extra money to be safe, as Vietnam is a cash-driven society.

Cautious Optimism

In Ho Chi Minh City, Herb Cochran, executive director of the American Chamber of Commerce in Vietnam, said he planned to have a three-month supply of drinking water on hand in anticipation of Y2K. Chamber members had met with consulate officials, and the general feeling was "cautious optimism that things won't be too bad," he said.

Lam Nguyen, International Data Group's (IDG) chief representative in Vietnam, said the country is still largely PC-based and Y2K repairs aren't too difficult. But consumers were stocking up on candles and instant noodles, he said.

IDG is the parent company of *Computerworld*. ▶

Advocates: Sites Still Don't Protect Privacy

Merchants oppose calls for legislation

BY ANN HARRISON
AND KATHLEEN OHLSON

Few of the 100 most popular shopping Web sites provide adequate privacy protection for consumers, and many track shoppers' purchases and online habits, according to a new report by Electronic Privacy Information Center (EPIC), a Washington-based privacy research group.

At Greater Risk Today

"On balance, we think that consumers are more at risk today than they were in 1997, when we first examined privacy practices on the Web," said Marc Rotenberg, executive director of EPIC.

The EPIC report, titled "Surfer Beware III: Privacy Policies Without Privacy Protection," examined the sites' compliance with the Fair Information Practices, a set of privacy protection principles outlined by the Federal Trade Commission (FTC) in 1998. It concluded that none of the sites adequately addressed the principles.

It also reviewed commercial sites to determine whether they used profile-based advertising or deployed cookies, which track users as they traverse the Web.

According to the report, 18 of the top shopping sites didn't display a privacy policy, 35 had profile-based advertisers that collect data from the sites and 86 used cookies. Rotenberg said legally enforceable standards of privacy are needed to ensure compliance with the principles, and new techniques for anonymity are needed to protect online privacy.

But Ben Isaacson, executive director of the Association for Interactive Media, said online businesses are still in their infancy and legislation would be premature now.

No Abuse

Commercial sites already secure their data, and that's cited in privacy notices, he said. "I haven't seen one single case of a company posting a [privacy] policy and abusing it," he added. "We've done what [the FTC] asked and abided by it. What more can we do?"

"Surfer Beware III," which is based on research conducted throughout 1999, is EPIC's third study of Web privacy. Its first report, "Surfer Beware: Personal Privacy and the Internet," was the basis for the FTC's subsequent review of online privacy practices published in 1998.

Elaine Rubin, chairwoman of Shop.org, said it's a good move to warn new online shoppers, but consumers have always needed to question if a business is legitimate.

Shoppers have to abide by the "classic rule" — verifying if the business is credible, Rubin said. "Check to see if it has a privacy statement, an 800 number and if live people are available." ▶

Correction

A Dec. 20 story, "ADP Bulks Up to Handle Online Trading" [News, page 12], misstated the daily transaction volume that ADP Brokerage Services Group handles. It is 1.2 million, not 1.2 billion.

Also, a company spokeswoman said ADP didn't have a problem handling transaction volumes before the technology upgrade, which shortens the time it takes to add processing capacity.

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Qualcomm Sells Phone Business

San Diego-based Qualcomm Inc. has said it will sell its Code Division Multiple Access wireless consumer phone business to a newly formed unit of Kyocrea International Inc. Terms of the deal weren't disclosed, but Qualcomm said Kyocrea would get Qualcomm's phone product inventory, manufacturing equipment and customer commitments.

Security Suit Ends

Symantec Corp., Network Associates Inc. and Network Associates subsidiary Cybermedia Inc. have settled copyright, trade secret and unfair competition lawsuits. The settlement ends a dispute that has been ongoing since April 1997. The terms of the companies' settlement are confidential.

Order Up Linux

Eltrax Systems Inc. released a Linux version of its Squirrel restaurant management system. The Southfield, Mich.-based company said Linux lets the Java-based Squirrel run on point-of-sale terminals with less memory than other operating systems.

Short Takes

3COM CORP. said quarterly earnings rose to $177.3 million, compared with $132.9 million for the same period in 1998. However, sales were down: $1.47 billion for the quarter, compared with $1.54 billion reported the year before. . . . MICROSOFT CORP. will have a new chief financial officer, John Connors, on Jan. 7 to replace Greg Maffei, who is moving to WORLD-WIDE FIBER INC. . . . John Arnot Wilson, a Silicon Valley pioneer and co-founder of the WILSON, SONSINI, GOODRICH AND ROSATI law firm, died last month. . . . Linux vendor RED HAT SOFTWARE INC. in Research Triangle Park, N.C., announced a 24% rise in quarterly revenue, to $5.4 million, but a $3.6 million loss. . . . John Elway, Michael Jordan and Wayne Gretzky will launch MVP.COM, a sports e-commerce site. MVP.com will acquire online retail business SPORTSLINE.COM INC.

ERP Problems Put Brakes On Volkswagen Parts

German warehouse having trouble with modified version of SAP R/3

BY CRAIG STEDMAN

ANOTHER PAINFUL ERP installation has surfaced, this time in Germany. Volkswagen AG is having trouble delivering spare parts to some car dealers there after turning on SAP AG's R/3 software in its central parts warehouse.

An SAP spokesman in Germany confirmed that the enterprise resource planning (ERP) vendor has assigned 13 employees to help Volkswagen fix the problems, which are forcing some owners of VW and Audi cars to wait up to several weeks for needed repairs.

But the spokesman added that the R/3 applications being used at the parts warehouse in Kassel, Germany, were heavily customized without SAP's involvement before Volkswagen turned on the system in September.

Officials at Volkswagen corporate headquarters in Wolfsburg, Germany, weren't available to comment on the problems at press time.

Dave Caruso, an analyst at AMR Research Inc. in Boston, said many users end up customizing ERP software to fit their business needs.

But often, that's "asking for trouble," he said. "These systems are so complex that what seems like a benign change has a good possibility of upsetting things downstream."

Delayed Shipments

System problems can have an especially big impact on warehouses by delaying shipments to customers and causing product inventories to build up, Caruso added.

For example, order processing problems in Hershey Foods Corp.'s warehouses after an installation of R/3 and other applications hampered the Hershey, Pa., company's ability to ship candy and other products to retailers during the lucrative Halloween season. Hershey executives blamed a 19% drop in third-quarter profits on the problems with the new system [News, Nov. 1].

German newspaper reports said Volkswagen — which typically delivers spare parts to dealers in one or two days — hopes to get back to its usual level of performance early this year.

The problems primarily affect deliveries to dealers in eastern Germany, many of which are providing rental cars to customers while waiting for parts to arrive. ▶

GM Pulls Ahead in Web Supply-Chain Race

Aims to save processing costs

BY LEE COPELAND

Three months ahead of schedule and before its automotive competitors, General Motors Corp. opened a Web-auction and catalog-procurement system to its vast network of suppliers Dec. 17.

The world's largest automaker wants to trim materials and processing costs by using its new TradeXchange online system. Detroit-based GM, which announced the online market in November, hopes to reduce the cost of processing a purchase order — from an average of $100 to $10 — by channeling most of its $87 billion in annual supply purchases through the Web site, officials said [News, Nov. 8].

GM's move puts it ahead of rival Ford Motor Co. Dearborn, Mich.-based Ford announced plans in November with Oracle Corp. to create AutoXchange, an online procurement system for Ford's suppliers. The site is set to launch early this month.

Big Three Supplier Networks

General Motors Corp.: Launched www.gmsupplypower.com in December. Online auction and trading forum for indirect and direct material suppliers was developed with Commerce One.

Ford Motor Co.: Launch of AutoXchange expected this month. Developed with Oracle Corp.

DaimlerChrysler AG: Operates internal online catalogs with select suppliers and is augmenting www.daimlerchrysler/spin, its supplier information network, to include procurement.

DaimlerChrysler AG in Stuttgart, Germany, is considering an online trading forum, but Jeff Trimmer, director of operations and strategy for procurement and supplies, said it's unlikely to be an auction. "We're not strong believers in online auctions," Trimmer said. "There is a place for online-auction and catalog buying, but we're more interested in developing long-term relationships with our suppliers."

GM said the industry players that have signed up for its TradeXchange include Tokyo-based Isuzu Motors Ltd., which averages $750 million in annual supply purchases.

Forrester Research Inc. in Cambridge, Mass., predicts business-to-business Web auction sales will expand to $52 billion in 2002 from $8.7 billion in 1998.

Analyst Steve Cole at Forrester said the auto industry could represent a big chunk of that activity. He said procurement networks should cut costs for automakers due to the efficiencies created by Web-based order management systems. The procurement networks will also boost the buying power of the automakers and their suppliers, pushing supply prices lower, Cole said.

Gary Ball, president of Ball Machinery Sales Ltd. in Guelph, Ontario, buys and sells used metal-stamping equipment from automakers. He said he purchased $400,000 in stamping equipment from GM through TradeXchange Dec. 17.

"Now the end user can buy direct from GM without going through a middleman, like myself. I would sell a press for $125,000, but the end user can buy direct from GM for $100,000," Ball said. "It's good for GM, and it's good for me, because I don't have to stand at an outdoor auction in bad or hot weather all day."

GM used auction software from Commerce One Inc. in Walnut Creek, Calif., to develop TradeXchange. Dealers need only a Web browser to purchase from GM, but suppliers that want to sell to GM need to license or purchase MarketSite trading portal software from Commerce One.

TradeXchange lets participants conduct purchases via an auction, catalog or through a bid-quote process.

The online supply-chain auction goes beyond the auto industry. Oracle Corp. and Seattle-based The Boeing Co. are reportedly discussing a deal to set up an online marketplace to automate purchases of airplane parts and other products, though both companies declined to comment. ▶

Drug Giants' Merger to Bring Systems Integration Hurdles

Monsanto's ERP plans anticipated growth

BY CAROL SLIWA

When Monsanto Co. implemented SAP AG R/3 more than three years ago, IT staffers strived to design a global system that would be flexible enough to handle any potential mergers or acquisitions in the future.

But even that insightful planning won't eliminate the need for some challenging integration work if the St. Louis-based company's planned $23.3 billion merger with Pharmacia & Upjohn Inc., announced the week of Dec. 20, is finalized, analysts said. The merger is aimed at creating a global pharmaceutical giant.

"Let's hope it's easier for these guys than it was for their competitors, because it just brought them to their knees," said Steven Shaha, an analyst at Stamford, Conn.-based Gartner Group Inc. Shaha declined to name those companies. "At least two of their competitors, for the time being, have given up and maintained separate structures for the formerly independent organizations."

Shaha said improved technology and lessons learned from past mergers should help Monsanto-Pharmacia & Upjohn tackle the job in two years. A Pharmacia & Upjohn spokesman refused to provide any information about his company's internal systems, but analysts said their integration challenges are similar, since many prominent pharmaceutical companies use SAP for back-office operations.

"CEOs stand up to talk about the economies of scale and how they're going to combine their sales forces and jointly sell their products," said Jim Shepherd, an analyst at AMR Research Inc. in Boston. "But

in order to do any of that, these companies have to achieve some level of integration of their information systems. And it is a very difficult thing to do."

Shepherd said CEOs in one recent pharmaceutical merger painted a picture of a sales representative being able to go to a customer, take a single order for products from both companies, deliver the products in one shipment and send out a single invoice.

Unfortunately, they learned that each company had its own homegrown order management system with its own set of master files for customers, products and other key data. The company finally settled on a new order management system, and a six-month project turned into one that's expected to take three years, Shepherd said.

Monsanto's global implementation of SAP, as opposed to a business-unit-by-business-unit approach, could help to ease

some of the integration burden.

"It reduces the complexity of the problem because the integration team will deal with only one instance [of SAP]," said Steve Cole, an analyst at Forrester Research Inc. in Cambridge, Mass. Cole recalled one European multinational consumer goods company that had 64 copies of SAP running in its different business units. The project manager expected to need five years to get down to a single code base, Cole said.

Monsanto hopes to benefit from its integration experiences involving two companies it acquired in 1998, DeKalb Genetics Corp. and Cargill Inc.'s international seeds division. ▸

Consultants Join Forces

BY JULEKHA DASH

On Dec. 21, two business-to-business e-commerce consultancies announced a merger, part of a wave of mergers intended to offer corporate customers more comprehensive electronic-business services.

Dave Mason, president and CEO of Boston-based Northeast Consulting Resources Inc., said the pairing of his firm with Needham, Mass.-based NerveWire Inc. will enable the combined company to offer both strategy consulting and system implementation.

"Remaining a niche boutique doesn't make sense. We came to the conclusion that what we

do needs to be linked to implementation capability," Mason said.

Lewis Clark, an analyst at Dataquest in Lowell, Mass., said a Dataquest survey found that 80% of customers that contract with a consulting firm for strategic advice want the same company to do the system implementation, too.

"This is a smart move for NerveWire because, as a start-up, the difficult thing is getting brains and customers. They're getting both in the same package," Clark said.

Other combinations of niche Internet services firms include:
■ On Dec. 13, San Francisco-based USWeb Corp. and Chicago-based Whittman-Hart Inc. announced plans to merge.
■ New York-based Razorfish Inc. completed its acquisition of Campbell, Calif.-based i-Cube Inc. on Nov. 2.

■ Atlanta-based iXL Enterprises Inc. announced Oct. 5 that it would acquire Tessera Enterprise Systems Inc. in Wakefield, Mass.

Clark said he expects more acquisitions by boutique consulting firms in the near future.

Financial terms of the deal between Northeast Consulting and NerveWire weren't disclosed, but the combined company is expected to have about 60 employees.

Northeast Consulting, with clients such as Bedford, Mass.-based Millipore Corp.; St. Paul, Minn.-based 3M Co. and Nokia Corp. in Finland, could have annual revenue of $4 million to $8 million, Clark estimated.

NerveWire was started in August by former employees of Cambridge Technology Partners Inc. in Cambridge, Mass., and has $60 million in venture-capital backing. ▸

Railroad Merger

"We are concerned about continued disruptions of service, like we encountered with the last three or four mergers," said Edward Rastatter, director of policy at Arlington, Va.-based National Industrial Transportation League, a trade group of railroad and truck customers.

Norman Black, a spokesman at United Parcel Service of America Inc. in Atlanta, said his company also had concerns about the merger, though it

was too soon to say more. "Rail mergers in recent years haven't been kind to us," Black said.

Rastatter and Linda Morgan, chairman of the Surface Transportation Board, both said they're concerned that customers and employees haven't fully recovered from other mergers. The Surface Transportation Board, an arm of the U.S. Department of Transportation, is responsible for approving rail mergers.

Customers are still experiencing service problems stemming from the splitting of Conrail Inc. and its acquisition by CSX Corp. in Richmond, Va., and Norfolk Southern Railway

Co. in Norfolk, Va. Those acquisitions were finalized in June. Customers also say they haven't had consistent service since Union Pacific Corp. in Omaha merged with Southern Pacific Rail Corp. in 1996.

No Problems?

In a statement, Morgan said she would have to carefully review the ramifications of the merger application. The railroad companies, however, said integration of their systems should be relatively problem-free.

"One of the problems that plagued the [earlier] merger[s] was that the railroads were

combining [different] information systems," said Burlington Northern spokesman Jim Sabourin. "But we already use the same IBM mainframe-based system."

Sabourin said that at the heart of Burlington Northern's transportation support system are three IBM 9X2s containing 30 CPUs capable of handling 40 MIPS each. The mainframes are linked using IBM's Parallel Sysplex technology. The system handles everything from monitoring railcars and planning trips to billing and scheduling.

Canadian National bought its system from Burlington

Northern. Jack Burke, a spokesman at Canadian National, echoed Sabourin's statements, saying problems would be nonexistent or, at worst, minimal.

Donald Broughton, a transportation analyst at A. G. Edwards & Sons Inc. in St. Louis, said he wasn't as worried about this merger as he had been about past mergers.

"This is not an integration of dissimilar [computer and operating] systems," he said. "There will be fewer problems caused by the integration of technology because [the railroads] use a similar information system infrastructure." ▸

NEWS

Carpet Maker Drops Groupe Bull for IBM

*Shaw Industries cites lack of skills,
few U.S. installs of French mainframe*

BY ROBIN ROBINSON

Shaw Industries Inc., the world's largest carpeting manufacturer, is consolidating its core information technology systems onto the IBM System 390 platform, moving off the Groupe Bull mainframe it has used for its core systems since the 1980s.

Shaw, in Dalton, Ga., has run a sales data warehouse on an IBM mainframe since 1997, said Robert Watson, director of IT at Shaw. He pointed to the Sys-

tem 390's availability and reliability and the cohesiveness of data between the IBM DB2 database, applications and the data warehouse, justifying the six-year, $14 million deal.

Ultimately, Watson said, Shaw dropped Groupe Bull because it couldn't ignore concerns about the ability to find skilled and qualified people to work with its mainframe.

"There are only five or six large Groupe Bull installs in the U.S.," Watson said. "We

weren't going to hang our hat on a vendor that didn't have a significant presence in the U.S. That would be suicide."

"The Groupe Bull platform has somewhat passed its 'sell by' date," said analyst Brian Jeffery, managing director of International Technology Group in Los Altos, Calif. "You can't get third-party support. You can't get skilled people. And the software is getting a bit long in the tooth."

Groupe Bull is based in Louveciennes, France, and more than 80% of its annual revenue is from its European installed base. The remaining 20% is from sales worldwide. Bill

Bradley, a Bull spokesman for the Billerica, Mass.-based worldwide software division, said the company recognizes IBM's dominance in the market and knows of Shaw's decision to move off the Bull platform.

Switching platforms can be perilous: It requires a company to invest in new application development skills, new database design and support skills and technical support to maintain the new system, Jeffery said. And there's always the possibility of a disruption to highly critical business applications.

So when companies do jump, it is typically to a familiar platform, he said.

"Since we already had the 390 and DB2 knowledge, why not put these other products on it?" Watson said. ▶

Thousands of Orders Roll In For Handheld E-Mail Devices

*But rivals seen in
cell phone camp*

BY DOMINIQUE DECKMYN

Investment bank Credit Suisse First Boston is deploying hundreds, and potentially thousands, of BlackBerrys, the wireless e-mail devices from Research In Motion Ltd. (RIM) in Waterloo, Ontario. Analysts say RIM is on a roll but may face increasing competition from Internet-enabled cell phones.

The RIM BlackBerry is a handheld device that accesses Microsoft Exchange e-mail and organizer information. RIM also sells a Post Office Protocol 3 Version of its device, called the Inter@ctive Pager. The company inked a deal last month to supply 100,000 of them to BellSouth Corp. In November, Dell Computer Corp. announced it would resell the BlackBerry to corporations.

"They have a really nice form factor," said David Hayden, an analyst at Mobile In-

sights Inc. in Mountain View, Calif., who is also a BlackBerry user. The device is smaller and has more features than comparable two-way pagers from Motorola Inc., said Hayden. But he said Motorola is soon expected to close some of that gap. He also said the BlackBerry may be too expensive for widespread deployment. It costs $399, with monthly flat-rate e-mail service starting at $39.99.

Credit Suisse First Boston has already handed out 350 BlackBerrys to mobile workers in a pilot project. That number may rise to more than 2,000 by the end of the year. Users at the investment bank will con-

**BlackBerry gives
instant access**

nect wirelessly to the company's Microsoft Exchange Server, accessing e-mail, contacts and appointments. Credit Suisse First Boston selected the BlackBerry because it gives users instant access to e-mail and lets them respond to it, a spokesperson said.

RIM's main competition will come from Internet-enabled cellular phones, said Ken Dulaney, an analyst at Gartner Group Inc. in San Jose. Dulaney said the BlackBerry also has the disadvantage of being based on a proprietary operating system, while the market is moving to devices based on the Palm operating system, Symbian or Windows CE. ▶

Auto Show to Display Instant Survey Results

*Net will carry data
from kiosk to screen*

BY JAMES COPE

When hordes of car buffs, dealers and automotive reporters converge for the big Detroit auto show next week, technology will be in place to capture their impressions of the new car models and futuristic "concept" cars.

The on-site network at the North American International Auto Show will be run by The Polk Co., a market researcher

in Southfield, Mich. Attendees will fill out questionnaires at five touch-screen kiosks, and the real-time results will be displayed on 15 big screens.

Dave Zaccagnini, Polk's vice president of information technology, called it "collecting information in the customer moment," that point when customers can see and touch the product and immediately give their impressions.

"The people who create the trends in the automotive market will be able to instantly see what those trends are," said Russ Shelton, an auto dealer

in Fort Lauderdale, Fla., and senior co-chairman of this year's show. He said he expects at least 700,000 attendees.

Survey data will be sent from the kiosks' Silicon Graphics Inc.'s Windows NT workstations over fiber-optic cables to SGI NT servers in Polk's on-site control room. There, data will be captured in an Oracle Corp. database and turned into survey results before being piped back over the network to the 42-in. screens on the show floor.

Video from live interviews at the show will fill the screens between survey results. ▶

Auto Results

*Auto show network shuttles
survey results in real time:*

1 Auto show attendees respond to questionnaires via touch screens.

2 Responses go to NT workstations in kiosks.

3 Data is piped over fiber-optic cables to servers in an on-site control room.

4 Data is automatically analyzed according to predetermined metrics to produce survey results.

5 Survey results are instantly posted on large-screen monitors on the show floor.

N.C. Suspends Online Auction Licensing

BY STACY COLLETT

North Carolina's effort to require online auctioneers to get licenses is on hold while the state figures out how its decades-old licensing laws apply to the Internet.

The North Carolina Auctioneer Licensing Board in Raleigh voted Dec. 15 to temporarily stop enforcing its recent decision that the sellers in Internet auctions must be licensed.

The board's executive director, Bob Hamilton, said the board will suspend enforcement indefinitely until it meets with the state legislature's Joint Select Committee on Information Technology to see how the Internet affects all of the state's licensing requirements.

"In the state, there are over 50 other occupational licensing boards. The [IT] committee wanted to see how the Internet affects all the different licensing boards and either try to do them all as a group or just make sure that everything is looked at," Hamilton said.

Room to Breathe

Steve Blake, chief operating officer at the Auction Users Association in Paso Robles, Calif., said the trade group's North Carolina members are relieved, for now.

"Some of them probably would not have been able to get licenses because they have bankruptcy in their pasts, and [the board does] credit checks. A lot of them aren't wealthy, and this is what helps them get by," Blake said.

He added that the IT committee may want to make the state a friendlier place for e-commerce.

The controversy began in November when the board reexamined existing statutes that required licenses for auctioneers and determined those laws applied to the Internet [News, Dec. 6].

The North Carolina law would require even small, at-home auction sellers in the state to pay an annual fee and pass a state exam. ▶

Windows 2000

Microsoft ratchets up security with Win 2000

Improvements include hard disk encryption for laptop users

By Jacqueline Emigh

In the increasingly important area of computer security, Windows 2000 offers something to just about everyone in the enterprise. Life is simplified for systems administrators, thanks to the ability to delegate some security chores to departments and individual end users. In addition, business managers and other end users can now be confident that their data is safe, even if they carry laptops home or on the road.

Major security improvements in Windows 2000 include the addition of hard disk encryption — a big boon for laptop users — along with support for password authentication through portable, wallet-size smart cards.

Another big change in Windows 2000 is that tasks associated with configuring security rights can now be assigned in a fine-grained fashion to specific users. According to Shanen Boettcher, a Microsoft product manager, this is because Windows 2000 is 100% object-based.

In contrast, according to Eva Katz, manager of Windows NT and Novell technologies at Concord EFS in Wilmington, Del., Windows NT takes more of an "all-or-nothing" approach. "In practice," she explains, "Windows NT lets you either assign all rights to a departmental server, or none. And I'm not about to assign all rights to anyone." Concord EFS is currently conducting a Windows 2000 pilot.

Says Robert Guraldi, president of Valinor Inc., a Microsoft solutions provider in Manchester, N.H., "Under NT, security rights could get confused in the enterprise setting. Often, there were simply too many domains." Similar to Concord EFS, Valinor is also conducting a Windows 2000 pilot, as are many of its customers.

Windows NT is organized around an architecture that includes a central PDC (primary domain controller). In Windows 2000, departmental administrators and other end users with the right permissions from the PDC can set up security policies for local machines. To protect against security errors or abuses at the departmental level, Windows 2000 gives the PDC the ability to "override" security policies configured elsewhere in the organization.

Katz plans to use the enhanced delegation capabilities in Windows 2000 to provide Concord EFS's help desk staff with the ability to configure security settings. "Up until now, the help desk has needed to come to IT whenever they've determined that a user's problem is caused by a lack of access rights," she explains. "We've needed to do a lot of administering. This will take away that burden." ▶

To read the full text of this story, visit **www.Windows2000Advantage.com.**

ADVANTAGE

The Web Magazine for IT Leaders Implementing Windows NT and Windows 2000 with Compaq Services and Solutions

INDUSTRY INSIGHTS

By Dan Kusnetzky

Making Unix and Win NT work together

It's been said repeatedly that making Unix and Windows NT work together is nearly impossible, that these two server operating environments (SOE) just can't interoperate harmoniously. In response, I say, "Hogwash." These two seemingly disparate software environments can be exploited simultaneously in many ways.

Application components

To evaluate joint Unix and Windows NT opportunities, it is first necessary to consider how distributed applications are constructed and where linkages between these two SOEs can be created.

A typical application can be segmented into four basic components: user interface, application processing, data management and file/storage management. In some cases, application processing, data management and file/storage management may be further subdivided (see chart).

Segmenting the application

There are at least seven solutions for making an application written for one operating environment work with the other.

Application Components

Distributed Application

| User Interface | Application Processing | Data Management | File/Storage Management |

Source: International Data Corporation, 1999

They are as follows:

1. Leave the application where it is currently being hosted and simply access it from the other environment using either Telnet or virtual user interface serverware.

2. Segment the application and have the user interface portion run on one or both platforms, while leaving the application logic, data management and file/storage management alone.

3. Put the user interface and part of the application logic segments on one or both platforms while leaving the other part of the application logic, data management and file/storage management in place.

4. Segment the application between the application logic and the data management layers.

5. Segment the application between the data management and file/storage management layers.

6. Segment the application in the middle of the file/storage management layers.

7. Although this really doesn't constitute segmenting the application, it's also possible to port the entire application, hosting it on both SOEs and then sharing the data between the environments.

Network application developers make more money than the rest of us because they understand the pros and cons of each of the approaches and can help their organizations choose the best approach for each application.

To read the full text of this story, visit **www.Windows2000Advantage.com**.

Point of View

Microsoft consultant cites Win 2000 lab work as key

By Bruce Hoard

Take it from a consultant who has been working on enterprise Windows 2000 implementations for the better part of two years: The benefits of Windows 2000 are bountiful, but prior to implementing it in a production environment, it is necessary to test the system thoroughly in a lab environment, followed by a pilot project.

"We have found that customers are most successful when they have a lab environment that emulates their production environment and they are able to get comfortable with their production resource servers," says David Cross, a senior consultant at Microsoft Consulting Services (MCS). "They also get comfortable with how they interact with the upgrade process and the things that they may have to do when they really do go into production."

Cross, who says Microsoft consultants are available to all enterprise customers, has been deeply involved with several of the approximately 50 customers participating in the Windows 2000 Joint Development Program (JDP). In his position, he has helped JDP customers with testing, capacity planning and deployment. He has also worked with customers in Microsoft's Rapid Deployment Program (RDP), which involves fewer companies than the JDP, but still focuses on implementing Windows 2000. MCS focuses on transferring knowledge and collaborating with solution providers to satisfy customers of all sizes.

Compaq, which has worked closely with Microsoft on the development of Windows 2000, has also amassed a considerable consulting force, having trained more than 1,000 of its consultants on the operating system. It is using an elite "Dream Team" of those consultants as faculty for a series of intense, five-day Windows 2000 Academies that Compaq is sponsoring for its customers around the world.

For example, Compaq, in addition to many other global alliance partners and Microsoft Certified Solution Providers, has worked closely with Microsoft on Windows 2000 by participating in both the JDP and RDP. ❯

For the full text, visit **www.Windows2000-Advantage.com**.

For more in-depth, hands-on Windows 2000 information, go to www.Windows2000Advantage.com

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E-Retailing

"It was not something we had anticipated," said Andersen consultant Robert Mann. Rather than reflecting systematic deficiencies in the e-commerce industry, he said, the site availability problems reflect the huge surge in online shopping traffic that overwhelmed retailers' servers. He said some of Andersen's clients have been scrambling to add servers in the past few weeks.

Reports indicate that online shopping activity was tremendous, with $1.2 billion spent online during the week of Dec. 6 to 12 alone.

But even when purchases come through, Mann said, consumers aren't always getting the answers they need for a fulfilling experience. Andersen's study found that sites rarely

Satisfaction Slips

Satisfaction with on-time delivery reached its lowest level since October (on a scale of 1 to 10):

Dec. 6 - 12	**8.24**
Nov. 29 - Dec. 5	**8.54**

Satisfaction with shipping policies:

Dec. 6 - 12	**8.57**
Nov. 29 - Dec. 5	**8.86**

8.8% of respondents said they're unlikely to shop at Web sites again, up from 8.3% the previous week.

SOURCE: FLEETBOSTON ROBERTSON STEPHENS INC. SAN FRANCISCO, SURVEY OF 1,000 ONLINE SHOPPERS

tell consumers when to expect to receive their orders. And different merchandise categories often take different amounts of time. Electronics, for example, often arrive within four days, while music can take as long as a week.

Order fulfillment is a pivotal issue for many customers. Last month, New York-based Jupiter Communications Inc. warned that although the holiday season would see an increase in online shopping, consumers would still limit their online spending to 10% of their total, partly because of worries about the timeliness of deliveries.

Lessons Learned

In three years online, Austin, Texas-based Garden.com Inc. has learned from its order fulfillment glitches and applied those lessons to the way it does business, said Chief Operating Officer Jamie O'Neill.

The company tells customers when to expect a delivery, he said, even if the delivery time will be long. The reason for providing the information up front is that customers have shown that they will return a product just because they were unhappy with the delivery experience, even if they like the merchandise.

To help improve the performance of its supply chain this year, O'Neill said, Garden.com invested heavily in demand forecasting. "A year ago, we didn't have a demand-forecasting group. This year, we have a group with five people in it," he said.

This past summer, the company applied its knowledge by contacting its Christmas-tree supplier in North Carolina with a forecast of consumer demand for this year based on the previous two. The supplier used that information to tell Garden.com to set a cutoff date for orders after which the merchandise wouldn't reach customers by Christmas. By providing customers with that date, the site was able to ward off potential disappointments.

More recently, the company implemented demand forecasting software from i2 Technologies Inc. in Irving, Texas.

Demand forecasting isn't an option for e-commerce neophyte Citystuff.com Inc. because it doesn't have any historical data yet. But the New York-based retailer, which debuted Sept. 1 selling the wares of merchants unique to the city, realized that fulfillment would be crucial. It made a point of dealing with only those merchants that had a demonstrated record of mail-order fulfillment, said CEO Ed Vincent.

To manage customer expectations, Citystuff.com reminds customers that ground shipping can take four to seven days and that all items are shipped from New York, Vincent said.

Mann said sites that make realistic predictions are likely to satisfy customers more than sites that emphasize speed that can't be delivered. "The key to it all is management of expectations," he said. ▶

Online Holiday Traffic Peaked Early Due to Shipping Concerns

Holiday shoppers in 1999 weren't procrastinators.

Online holiday shopping peaked Dec. 12 – three days earlier than observers expected – amid consumers' concerns that their orders wouldn't get filled in time, according to Nielsen NetRatings Inc. in New York.

"Fearful of delivery logistics, surfers caused a noticeable drop in the traffic the week before Christmas," said Peggy O'Neill, an analyst at Nielsen NetRatings, which counted 17 million unique online shoppers Dec. 12.

Early returns from industry watchers show that the big winners in the holiday shopping season were those that had weathered a strong holiday season in the past, according to Mike May, an analyst at Jupiter Communications Inc. in New York. Amazon.com, eToys.com, Landsend.com and Gap.com all handled orders and fulfillment well, he said.

"The clear losers were sites that weren't able to control their own fulfillment" and relied on outsourcing or drop-shipping from manufacturers, he said.

Others underestimated the impact of their marketing initiatives. Petopia, Sharper Image Corp. and Toys R Us' online unit are among the retailers that have experienced problems [News, Nov. 15].

Plano, Texas-based J. C. Penney Co. has seen its online traffic climb and e-commerce revenue increase from $14.5 million in

1998 to between $75 million and $95 million in 1999, said Ron Hanners, the company's executive vice president of Internet retailing.

This holiday season, the site attracted about 2 million visitors per week and processed 2,000 to 10,000 transactions per hour, Hanners said.

To accommodate all the traffic, J. C. Penney beefed up its site architecture from a single commerce server 14 months ago to 48 servers, Hanners said.

But from front to back, a transaction touches on about 60 points throughout J. C. Penney's systems, Hanners said, and that complexity has resulted in "momentary challenges" during times of peak stress on the company's point-of-sale terminals, catalog call center and Web site. All of those feed back to the same mainframes, for instance.

Overall, no site was immune to temporary snafus, but observers said the biggest lesson companies will carry into the next holiday season will be to focus more on fulfillment than on advertising.

"It's better to control the number of customers that visit your site and surprise and delight every one of them than it is to open the floodgates and irritate every other customer that comes to your store," May said.

– Stacy Collett and David Orenstein

H-1B Miscount

nounce late this month how many extra visas the INS granted, but the auditor won't issue more comprehensive findings — such as the cause of the error and recommendations — until March.

The INS announced in early October that it had granted as many as 20,000 too many H-1B visas in fiscal 1999, which ended Sept. 30. But it backtracked shortly thereafter, saying it didn't know the precise number of visas it had issued.

The INS has ruled out two possible courses of action: revoking any approved H-1B

visa petitions or assigning the surplus to past years, when the INS didn't meet its quota. But the fact that the agency is still considering deducting the surplus from this year's quota has prompted criticism from individuals who believe that only Congress has the legal authority to make such a decision.

Congressional Push

Carl Shusterman, an immigration attorney in Los Angeles, said only Congress could take such action, but he added that he doubts Congress would cut into this year's quota. "There's a huge charge among Republicans to raise the H-1B visa cap," he said. In early October, Sen. Spencer Abraham

INS/H-1B Visa Timeline

October 1999: INS said it granted as many as 20,000 extra H-1B visas in fiscal 1999. The agency then backtracked, saying it didn't know how many visas it issued.

November 1999: INS hires Big Five firm KPMG to perform audit.

December 1999: KPMG begins INS/H-1B audit. INS reveals that its numbers for visas filed at top 20 firms that use H-1B workers were inaccurate.

January 2000: KPMG continues in fact-finding mission, expects to release numbers by the end of the month.

March 2000: KPMG expected to reveal cause of INS error.

SOURCE: IMMIGRATION AND NATURALIZATION SERVICE WASHINGTON

(R-Mich.), chairman of the Immigration Subcommittee, sent a letter to the INS stating that the department lacked "the statutory authority" to reduce the cap for fiscal 2000.

"We won't respond to the senator until we get the overage number. Then we'll have our legal [response] ready as to why we have the authority" to assign the visa surplus to this year's count, Schmidt said.

The INS also announced on Dec. 17 that a statement last June on the number of H-1B visas filed in fiscal 1998 by the top 20 U.S. companies contained erroneous figures. Those companies included Oracle Corp., Lucent Technologies Inc. in Murray Hill, N.J., and KPMG.

Harris Miller, president of the Information Technology Association of America, an industry trade group in Arlington, Va., said he was dismayed by the INS's reporting inaccuracies.

"This [H-1B visa] count has real implications for real employers," said Miller, who added that the mistakes hurt companies and academic institutions that make hiring decisions based on numbers released by the INS.

Schmidt said the INS will "no longer put out numbers until we're sure of the integrity of the data. That's why we demanded a turnaround so quickly [from KPMG]. Congress needs [the numbers]; employers need them." ▶

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[AND ITS IMMUNE SYSTEM IS A WONDER OF NATURE.]

DELL

Lawyer Advises Gearing Up Now for Y2K Suits

Timing and documentation are keys to survival — for plaintiffs and defendants

BY KATHLEEN MELYMUKA

FROM A legal standpoint, the most important Y2K activity over the next month is to get ready to initiate or respond to a year 2000 lawsuit.

The federal Year 2000 Readiness and Responsibility Act, which supersedes most state legislation, limits liability and certain types of damages, provided that the parties follow proper procedures in a timely manner, said Dan Has-sett, a partner at the law firm Williams Mullin Clark & Dobbins in Vienna, Va.

A summary of the act is available at the Information Technology Association of America's Web site (*www.itaa. org/year2000/y2kactsum.htm*).

The law calls for a company that experiences a Y2K failure to send a detailed notice to the prospective defendant before filing a lawsuit. The notice must describe the failure and the remedy sought and give the defendant the opportunity to make things right. The defendant has 30 days to respond with an offer to fix the problem or go to arbitration. Then the defendant has 60 days to come up with a plan for the fix or begin arbitration.

With this kind of timetable in mind, Hassett said, "today you need procedures in place and an idea of how you will respond." That means knowing the process specified in the Y2K law, having all the information you need to initiate an action — including contact people and addresses for each vendor — and keeping the boilerplate parts of a letter ready to go so that you can fire it off quickly in the event of a failure and start the clock ticking, he said.

Taking Action

Remember, too, that the clock may be ticking at your expense. If someone sends your company a notice alleging that a system failure on your part caused harm, you need to make sure that the complaint gets to your legal department immediately. With only 30 days to respond, you don't want it sitting in an "in" basket.

You should also have a boilerplate response ready and a process in place to assure that you respond within 30 days.

"If you respond on the 31st day, you lose your rights," Hassett said.

Businesspeople also need to understand the legal concepts of "duty to mitigate" and "proportionate liability" as they affect Y2K cases, Hassett said.

"These are two separate issues, but they get back to the same action item," he said. Both are based on the principle that holds when a baseball batter gets hit by a wild pitch: He gets a free base only if he tried to get out of the way.

"If you're a plaintiff, you can't sit around and let the business fall to pieces and bring a claim," he said. It is the responsibility of your company to have a contingency plan, go to alternate vendors and do whatever it can to mitigate the damage. If the defendant can show that your company didn't do those things, the company may be found responsible for a portion of the damages.

To escape being assessed proportionate liability, your company needs to be able to tell the story of how it prepared for Y2K. If you haven't already done so, collect contemporary documents to show your Y2K assessment, remediation, validation and contingency-planning activities.

"It's a lot harder to document five months down the road," Hassett said.

Then keep the documentation up-to-date moving forward, and be sure to carefully document any failures that occur as well as how you've tried to mitigate the damages. ◗

Survey Reported Decrease In Planned Y2K Shutdowns

But quality an issue in Y2K preparedness

BY ROBIN ROBINSON

Reflecting higher confidence in their internal systems, fewer information technology leaders were considering pulling the plug during the New Year's weekend, according to Cap Gemini America Inc.'s final Y2K preparedness survey.

In the poll, 28% of IT leaders at 147 Fortune 500 companies said a temporary shutdown was still an option — down from 33% in September.

While the number of IT departments experiencing a Y2K-related failure rose to 88% in December from 82% in September [News, Sept. 27], only 2% experienced a failure so severe that it disrupted business.

"In most cases, people were able to fix it before it turned into a business disruption," said Jim Woodward, a senior vice president at Cap Gemini America.

Woodward said he expected the percentage of companies experiencing a business interruption due to Y2K to be higher than 2%, but he wouldn't hazard a guess.

The 147 IT managers who responded to the latest survey, conducted in December, said about 15% of the overall errors were associated with dates projecting forward into 2000, while 85% arose when systems were tested as if the present date was in 2000, Woodward said.

Persistent Problems

Nearly 60% of survey respondents in December said their systems suffered failures in applications that already had been renovated, due to either the patch itself or something else in the application that was overlooked, Woodward said. That's up significantly from the 41% of respondents in September who were blaming the cure for the affliction.

"When we check, we find on average 10% of programs still have serious errors," Woodward said. "There's a quality issue here." ◗

Some Key Facts and Events in Y2K History

■ The first printed mention of Y2K was made by Paul Gillin in *Computerworld* on Feb. 13, 1984; the first printed warning about Y2K was issued by Peter de Jager in the pages of *Computerworld* on Sept. 6, 1993.

■ Y2K costs will reach $75 billion, predicted Peter de Jager in the Sept. 16, 1993, issue of *Computerworld*.

■ Y2K repair costs will reach at least $100 billion and may go as high as $114 billion – $365 for every man, woman and child in the U.S., reported the U.S. Department of Commerce in November 1999.

■ The estimated worldwide cost of fixing the Y2K bug, according to analysts: Cap Gemini America Inc. – $858 billion; Gartner Group Inc. – $600 billion; International Data Corp. – $300 billion.

Comparing the cost of Y2K fixes with the costs of various natural disasters:

■ Hurricane Floyd caused infrastructure losses of $82.4 million, insured losses of $50 million and other losses of about $2 million, officials said, according to a Nov. 30, 1999, Reuters report.

■ Initial estimates on the Turkish earthquake suggest it will cost $8 billion to repair the quake's damage, reported the *International Herald Tribune* on Dec. 2, 1999.

■ The U.S. Department of Agriculture estimates that the cost of crop losses in the eastern part of the country due to the 1999 summer drought will be $1.1 billion, according to the Gannett News Service on Sept. 1, 1999.

■ Y2K projects caused changes in vacation policies at 43% of 150 large companies, with 97% restricting December and January vacations. Yet 40% weren't planning to reward IT staff with money or time off, according to an August 1999 *Computerworld* survey.

■ 44% of major companies said they wouldn't have their mission-critical systems compliant by this month, according to a September study by Cap Gemini America.

■ Westergaard.com Inc. (*www.wbn. com/y2ktimebomb/*) reported that only 75% of federal mission-critical systems would be finished by Jan. 1.

■ The White House's Y2K Information Coordination Center cost $50 million and was staffed with 200 federal workers.

■ 40% of small businesses have done

Feds Give Some States Bad Y2K Grades

BY PATRICK THIBODEAU

A federal Y2K report card on the repair status of state-administered federal programs found that eight states and the District of Columbia were behind in fixing some of their systems.

The quarterly report, released Dec. 13, was the 11th, and last, from the U.S. Office of Management and Budget (OMB).

Alabama, California, Connecticut, Illinois, Kentucky, Minnesota, North Dakota, Oklahoma and the District of Columbia haven't completed repairs on some of the 10 systems that administer federally funded nutrition, child-welfare and Medicaid programs, the OMB said.

But some of the states said the OMB's information is out-of-date. Kentucky, for instance, had reportedly fixed one child-care system before the report card went out. The state asked the OMB to change its listing, but to no avail, said John Tomlinson, Kentucky's Y2K coordinator.

Connecticut, which was cited for the condition of its child-welfare system, has also repaired the system in question, but not in time for the OMB's report, said Peter Sullivan, the director of that state's Y2K office.

The OMB had more positive things to say about the data exchanges between state and federal agencies.

Federal agencies have fixed all but one of the 284 data exchanges needed to administer federal programs. Most data exchanges with the private sector are also ready, the OMB said. ▶

The Night Before Y2K

'Twas the night before Y2K,
And all through the nation
We awaited The Bug,
The Millennium sensation.
The chips were replaced
In computers with care,
In hopes that ol' Bugsy
Wouldn't stop there.
And Ma with her PC,
And I with my Mac
Had just logged on the Net
And kicked back with a snack
When over the server
There arose such a clatter.
I called Mr. Gates
To see what was the matter.
When what with my
*   wandering eyes*
Should I see?
My good old Mac
Looked sick to me.
The hack of all hackers
Was looking so smug,
I knew that it must be
The Y2K Bug!
His image downloaded
In no time at all,
He whistled and shouted,
"Let all systems fall!
Go Intel! Go Gateway!
Now HP! Big Blue!
Everything Compaq,
And Pentium, too!

All processors big,
All processors small,
Crash away! Crash away!
Crash away all!"
As I drew in my breath
And was turning around,
Out through the modem,
He came with a bound.
His eyes — how they twinkled!
His dimples — how merry!
As midnight approached,
*   though,*
Things soon became scary.
He had a broad little face
And a round little belly,
And his sack filled with virus
Quivered like jelly.
He was chubby and plump,
Perpetually grinning,
And I laughed when I saw him,
Though my hard drive stopped
*   spinning.*
He spoke not a word,
But went straight to his work,
He changed all the clocks,
Then turned with a jerk.
With a twitch of his nose,
And a quick little wink,
All things electronic
Soon went on the blink.
Then I heard him exclaim,
As he ran out of sight,
"Happy Y2K to you all,
It's been a helluva night!"
*   — Ditty that has been making*
*   the rounds on the Internet*

SNAPSHOT

Be Careful What You Ascribe to Y2K

In a typical week, noticeable computer glitches are fairly common

Problems Visible to Employees	Percentage Reporting
Application-specific crash or glitch	78%
Printer problem	76%
Desktop operating system crashes	72%
Network crash or a slow network	70%
Internet crash or no Internet connection	58%

Problems Visible to Customers or Suppliers	Percentage Reporting
Network crash or a slow network	43%
Internet crash or no Internet connection	39%
Application-specific crash or glitch	38%
Problems with Web or e-commerce applications	33%
Problems with customer service applications	27%

Base: 119 IT professionals at organizations with 500 or more employees

SOURCE: COMPUTERWORLD RESEARCH

Follow-up on Y2K Breaches

Pittsburgh-based Carnegie Mellon University's Computer Emergency Response Team (CERT) Coordination Center has created the following Y2K-specific Web sites:

■ During the year 2000 transition, CERT will publish reports of activity at *www.cert.org/y2k-info/y2k-status.html*.

■ The Y2K list of frequently asked questions (*www.cert.org/y2k-info/Y2K_FAQ.html*) has information to help determine whether a computer failure is Y2K-related or a malicious attack.

■ A paper titled "Cyber Infrastructure and Malicious Expectations during the Y2K Transition Period" by CERT and the Threat Analysis Working Group is available at *www.cert.org/y2k-info/y2k-cyberthreats*.

■ CERT's Year 2000 Computer Viruses and Hoaxes Web site is located at *www.cert.org/y2k-info/y2k-virus.html*.

Y2K Comes Early

A missing software upgrade led the West Des Moines Water Works to send out customer bills with a due date of Jan. 3, 1900. Monthly charges and the city's water supply weren't affected, the Iowa company said. Corrected statements were mailed, "but you could pay the first bill and be fine," a spokeswoman said. The upgrade is now installed.

Latin America Worried

Officials in Brazil and Mexico say small businesses in those countries haven't taken sufficient measures to be Y2K-compliant, largely because they use pirated software. Colombian government agencies are reportedly noncompliant, and Argentine aviation officials warned of radar problems at airports in small cities.

Run on Milk-in-a-Box

Parmalat USA said sales of its shelf-stable milk increased sharply last month due to pre-Y2K pantry stocking. The leading seller of Parmalat Milk Box, Netgrocer.com, reported that average daily sales topped 700 units last month. Average daily sales for prior months was 107.

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nothing about Y2K, according to the National Federation of Independent Business.

■ Financially wealthy companies were spending 5% to 8% of their IT funding on Y2K, while poorer companies were spending up to 40% of their IT budgets, noted a September study from Cap Gemini America and Rubin Systems.

■ The average mainframe or midrange system contained 510 date-related errors after remediation, according to a study by SEEC Inc.

■ Testing catches 30% of Y2K bugs, while independent validation and verification catches another 40% to 45%, reported a study by SriSoft Corp.

■ If a major brokerage has Y2K-related transaction problems on Jan. 3 (the first day of trading this year), the Securities and Exchange Commission won't give out information specific to that company, *Computerworld* reported in the Nov. 22, 1999, issue.

■ Y2K could lead to $1.1 trillion in damages worldwide, with the U.S. cost estimated at $115 billion, not including legal and insurance costs, said analyst Nick Gogerty at London-based International Monitoring in October 1999.

■ Some Y2K budgets: Union Pacific Corp. – $46 million; Merrill Lynch & Co. – $525 million; Nabisco Inc. – $42 million.

■ The labor crunch will continue post-Y2K: 1.6 million new IT workers will be needed between 1999 and 2006, according to a U.S. Department of Commerce report in July.

ducted by *USA Today* and the National Science Foundation found that just 7% of Americans said they expected major problems to result from Y2K mistakes, while 55% said they believed the effects will last only a few days; 42%, a slight rise from previous polls, planned to stockpile food and water; 21% planned to withdraw some money from their accounts; 34% (down from 63% a year ago) expected banking and accounting systems to fail; and 51% planned to avoid air travel on or around Jan. 1, though only 27% believed air traffic control systems would fail.

■ A November poll of 400 adults released by Hibernia National Bank in New Orleans found that only 7% of Americans were "very concerned" about Y2K and that only 11% of consumer and 8% of commercial bank customers planned to withdraw extra cash.

■ Gartner Group predicted that more than half of U.S. companies wouldn't achieve 100% compliance by the end of 1999 and that 15% of companies and government agencies in the U.S. would suffer Y2K-related mission-critical systems failures through the first quarter of 2000. Where failures occur, 10% will last three days or more.

■ How many people were needed to fix Y2K? Gartner Group estimated one man-year for every 100,000 lines of code. IBM reckoned that the average large company will spend up to 400 man-years on the problem. On average, 100,000 lines of code will require one year of full-time labor to correct.

MORE ONLINE

For more Y2K facts and statistics, visit our Web site.
www.computerworld.com/y2kwatch

MARK HALL

Agenda item No. 1

WHILE READING THE ARTICLES in this week's IT Agenda 2000 special report, I was struck by a recurring item that should be at the top of your to-do list this year: *Know your business.* No, not the business of IT. Rather, the one that assures that your paycheck doesn't bounce.

So this year, you'll need to spend more time thinking like a business line manager and less like a technologist than ever before. Certainly you'll encounter upgrade choices, migration possibilities, consolidation considerations and just plain cool products. You'll be tempted to justify them, if only from an IT perspective. But you must resist these temptations, unless, together with other groups, you can find a business reason for them.

MARK HALL is *Computerworld*'s West Coast bureau chief. You can contact him at mark_hall@computerworld.com.

As Dow Corning CIO Harry Ludgate explains in "Expand ERP Beyond the Back Office" [page S13], developing effective business processes precedes deployment of nifty new SAP e-commerce enhancements at his company because that, not technology, is the real challenge. In "Prepare for Windows 2000" [page S6] — something that will take up a lot of IT time this year — we are advised by IT managers at Prudential Insurance and Pacific Life Insurance to create "cross-disciplinary teams" to oversee the operating system rollout. Key to adopting

Win 2K at Travelers Insurance, according to CIO Diana Beecher, is whether Microsoft's Active Directory makes the business "easier to run."

This doesn't mean you should ignore your own organization and simply slum your way through interdepartmental meetings. When you get a free moment, lead a post-Y2K self-audit. I suggest that you peruse "Conduct a Y2K Post-mortem" [page S16] and follow its advice. So many companies have outsourced fixing their date-impaired programs that the invaluable knowledge gleaned from the process has been lost forever.

But maybe you're one of the smart CIOs, like Gerald Miller of Sears. From the start, he insisted that Y2K meetings analyze every conceivable "collateral benefit" of the remediation project. Of course, being a smart CIO, Miller focused on those areas that could be readily applied to business areas.

Maybe Miller and those of you like him had this year's No. 1 IT agenda item on your list last year. ◗

"YOU'RE RIGHT, JERRY. WE SHOULDN'T LOSE OUR MOMENTUM. BUT I THINK OTHER ISSUES HAVE PRIORITY OVER OUR 'Y10K' PREPARATION."

WILLIAM ULRICH

Did IT miss an important Y2K lesson?

FROM 1993 TO 1995, before the term *Y2K* was coined, I thought that year 2000 projects would make businesses smarter about managing their information assets and tackling tough infrastructure challenges. I was wrong. There have been some near-term benefits, but we still lack integration strategies for core technologies and are falling back into the short-term thinking that spawned Y2K.

Among the near-term benefits: IT teams have built solid inventories of hardware and software assets and have done a commendable job of dumping obsolete and non-mission-critical technologies.

We can also thank Y2K for forcing us to upgrade systems software, application packages, PC hardware and networking technology. Project teams have a better appreciation of how software tools can leverage maintenance and testing, and IT has estab-
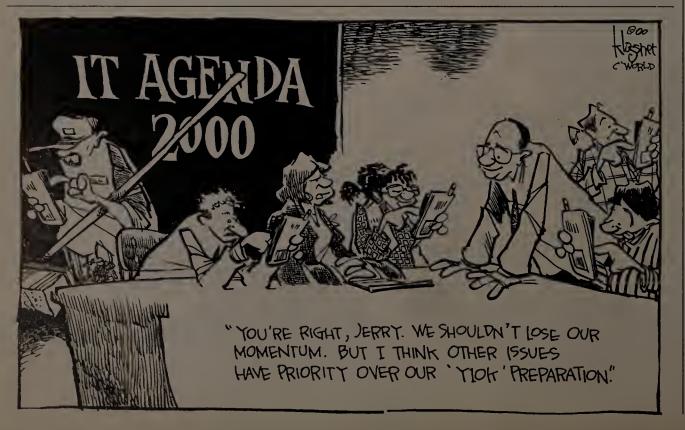
WILLIAM ULRICH is president of Tactical Strategy Group Inc. and co-founder of Triaxsys Research LLP. Contact him at tsginc@cruzio.com.

lished stronger relationships with service providers and business units. Meanwhile, business units have a better understanding of distributed systems, embedded technologies, supply-chain management and contingency plans.

In an ironic turn of events, companies canceled large-scale package-implementation projects before Y2K would have caused them to fail anyway. Many of these megaprojects were struggling with technical problems, so Y2K inadvertently helped companies avoid throwing good money after bad on such doomed projects.

Y2K should have been a catalyst for launching technology and application integration initiatives, but many companies may have missed this opportunity. As companies sort through their Y2K problems, they must also determine where to go next. Many executives are reviewing new information strategies. One challenge is how to address poorly integrated, highly redundant legacy systems that just won't go away. But ERP projects are no longer the end-all solution, given implementation complexities and customization difficulties.

For decades, the IT industry has raced from one panacea to another. In the early 1980s, fourth-generation languages and, later, integrated computer-aided software engineering tools came along. In the 1990s, executives demanded that

mainframes be replaced with client/server systems. Later, we witnessed the explosion of ERP package offerings. But none of these alleged "solutions" has addressed the real issues facing business and IT organizations.

Business units see IT as a cost center and not as an integral part of their business strategies. Executives need to integrate IT planning into their business strategies and share them with IT planning teams. Integration problems are rampant, as evidenced by the demand for data warehouses, graphical front ends or anything else that might help connect disparate systems. But these are interim solutions, not the final answer.

Now we're racing to build e-commerce systems, which further expose critical systems-integration problems. Ask anyone who couldn't get a December holiday order filled. Web sites were down, customer support was nonexistent and poorly integrated fulfillment systems were dragging down what promised to be a revenue boom. Businesses must retool support infrastructures and synchronize these strategies with information integration plans. Legacy systems that can't interface with one another or with e-commerce systems can't be fixed overnight. This will be a bigger challenge than Y2K, but I'm not sure we're up for it. ◗

DAVID MOSCHELLA

Are companies banking too much on stock prices?

THERE WILL BE all sorts of important stories in the new year — the Microsoft antitrust case, the growth of Linux, the acceleration of wireless and PDA technology, the ongoing e-commerce boom and many others. But as someone who spends a lot of time assessing company strategies, I'll also be keeping tabs on a much less prominent issue: What happens when a company's stock price becomes its main strategic determinant.

Once upon a time, we were taught that corporate strategies should be driven by factors such as core competencies, opportunity analysis, return on investment, risk assessment and similar fundamentals. Indeed, during the 1980s, American companies were routinely savaged in the media just for allowing stock price considerations to significantly influence their quarterly tactics. In hindsight, of course, the critics couldn't have been more wrong; American businesses' emphasis on short-term financial results appears to have paid off rather handsomely.

Perhaps this helps explain why, in the Internet age, the influence of stock price has increased by yet another order of magnitude. Ever since companies like Amazon.com, Yahoo and, more recently, Red Hat enjoyed their multibillion-dollar IPOs, their most important strategic challenge has been to conjure up a business model that could possibly justify their sky-high valuations. Not surprisingly, all three have decided that hypergrowth is really the only acceptable path forward.

For example, since there was clearly no way that Amazon could justify its stock price as a mere seller of books, it actually has had little choice but to try to turn itself into an online Wal-Mart. Similarly, would Yahoo shareholders really have tolerated a CEO who was content to build just a premium search engine? More recently, Red Hat's purchase of Cygnus Solutions and its consulting services is evidence of a similar pressure to grow at all costs.

The great question for the next few years is whether these financially driven strategies will work as well today as they did in the 1980s or whether they will send companies off in unnatural and ultimately dangerous directions. Is Wall Street wisely spurring companies to move full speed ahead to capture the opportunity of a lifetime, or is greed and speculation about to destroy otherwise perfectly sound companies?

We've already had at least one casualty as a result of financial excess: Netscape. When Jim Barksdale, et al. woke up one morning to a $7 billion valuation, it was clear that this newfound wealth would quickly vanish if Netscape remained merely a browser company. Hence, the big push into all-manner-of-enterprise software, a clearly dubious move that quickly contributed to the company's decline and eventual sale to AOL.

You can already see signs of similar risks for today's giants. Many people I know are tired of messy portals and are relieved to experience the pure search capability of a site like Google.com. Similarly, because they now must behave like titans of industry, key members of the Linux community are already losing some of their special luster. I've even started to check out Barnesandnoble.com as a quiet protest of Amazon's cluttered path.

We live in strange times when stock market pressures force Internet start-ups to be overly aggressive and pre-Internet companies to be overly conservative. This irony is deepened by the fact that this same financial pressure makes it almost impossible for Web and pre-Web companies to invest in one another. I sure hope that, as in the 1980s, the market knows what it's doing. But this time, I tend to doubt it. ◗

READERS' LETTERS

Avoid sensationalist headlines, please

THOMAS Hoffman's Dec. 13 story on *Computerworld* online, "Report: Majority of Water, Sewage Utilities Not Y2K-Ready," is just what we need to keep order during the millennium rollover!

The biggest risk we face is public panic that springs from unconfirmed and erroneous information. I would expect *Computerworld* to understand that and avoid just this kind of headline.
Steve Nelson
Chicago

IT employers need a reality check

IF THE IT industry wants to do better at recruiting and retention, it is going to have to get in touch with reality.

We have to realize that IT people have a life.

This may mean increasing staffing levels to the point where 24/7 availability is no longer needed. We must give up expecting people to do huge projects overnight.

Overly aggressive schedules just mean that programmers write bad code that needs a lot of maintenance later on. We must be ready to invest in people, and then we must be ready to pay them enough to keep them.
Steve Hovland
San Francisco

Good advice unheeded

THE CITY of Oakland, Calif., should have been able to avoid the problems it is experiencing with its implementation of Oracle's enterprise resource planning applications ["ERP Project Problems Plague City Payroll," Business, Dec. 13]. As one basic example, there is no good excuse for not having identified and contracted for ample training for the city's staff. Oracle itself never should have signed the deal without having been completely comfortable with the amount of training specified.

Oakland could have saved itself a lot of grief and expense if it and its consultant had executed this procurement differently and if it had taken to heart the load of good advice that Joe Auer and others have provided in the pages of *Computerworld*.
Sheldon S. Cohen
President
Systems Consulting Group Inc.
Boston

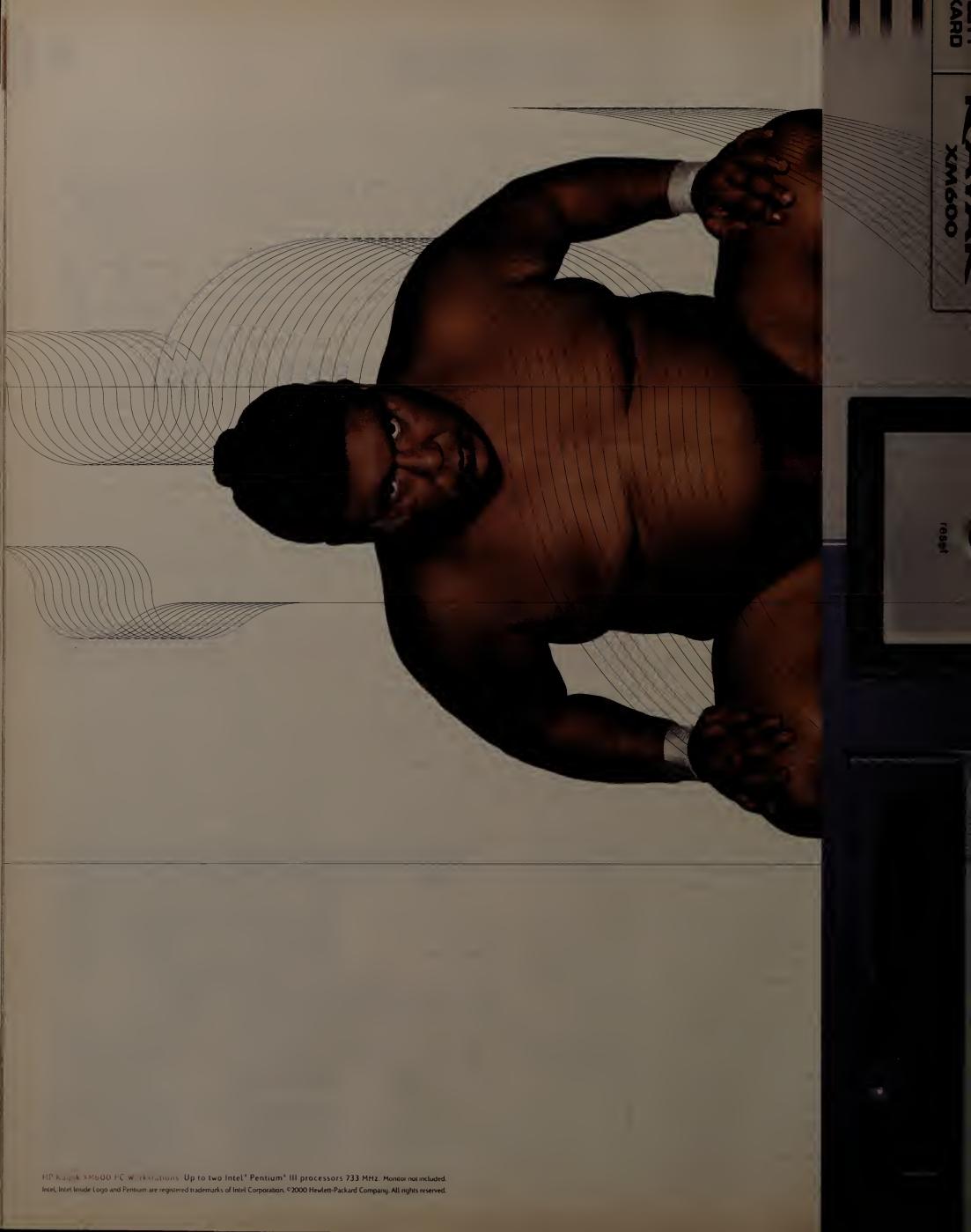## Balanced Microsoft coverage appreciated

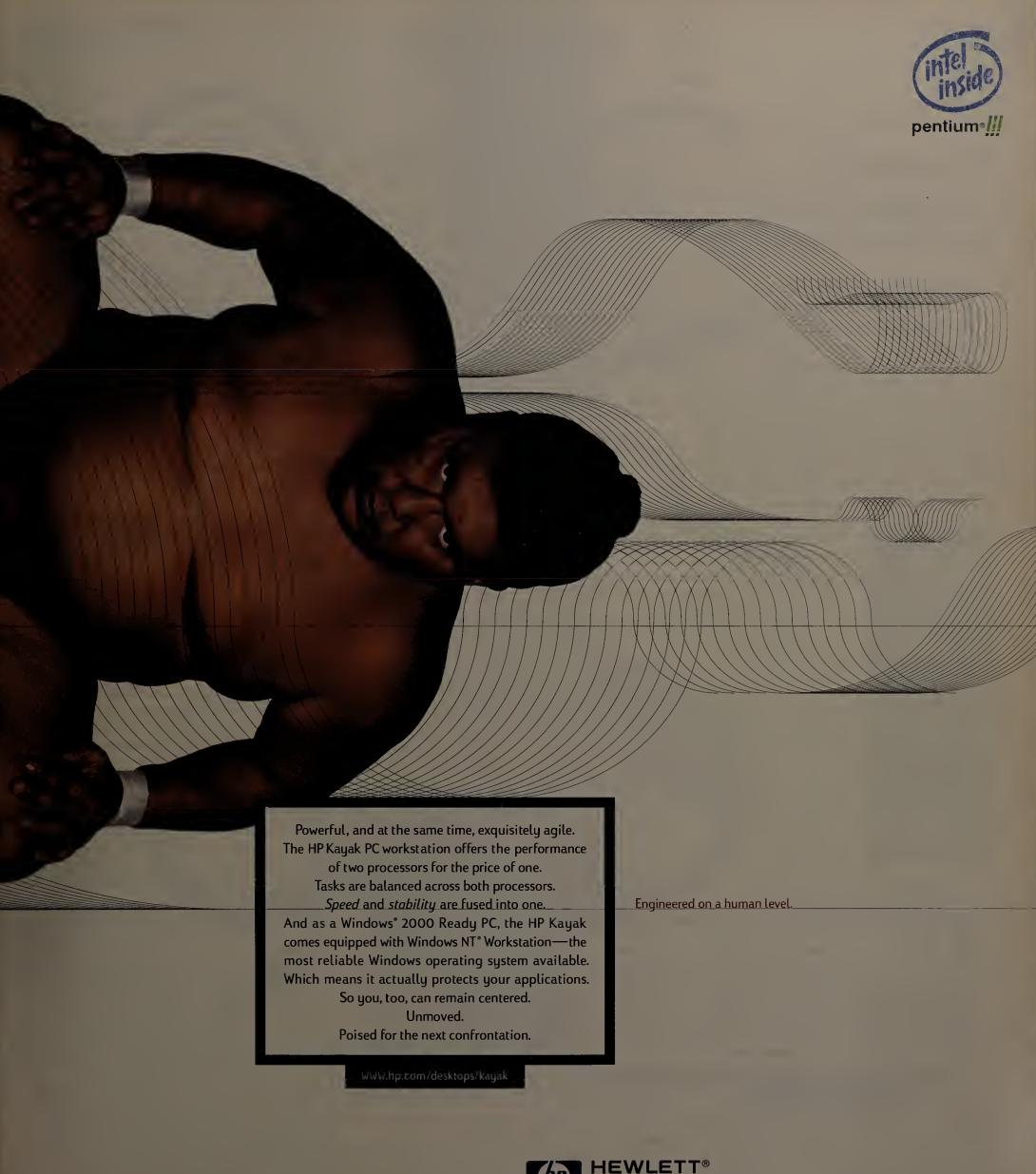I ENJOYED reading David Moschella's fresh and balanced perspective regarding the Microsoft ruling ["A Harsh Ruling, Yes. But Microsoft Has Only Itself to Blame," News Opinion, Nov. 15]. It's nice to see some healthy insights finally seeing the light of day. Too many people have been too quick to jump on the 100% pro-Microsoft/anti-government bandwagon and vise versa.
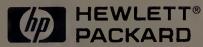
This column focused on very relevant points that support both sides of the argument. I look forward to reading more and ultimately to seeing how this whole affair unfolds.
Lou Hablas
Atlanta

ROBERT SUTTON

Knowledge management is not an oxymoron

THE EVIDENCE about corporate knowledge-management programs keeps rolling in, and it isn't pretty.

Companies have spent hundreds of millions of dollars on computer hardware and software, on hiring knowledge-management experts and on maintaining data warehouses of best practices and past experience. The designers of these systems imagined they were inventing electronic libraries that would provide every employee quick and easy access to a firm's collective wisdom.

The reality is that most information warehouses have become junkyards, databases cluttered with forgotten information. They are seen as a waste of money by those they were meant to help. The most valuable employees often have the greatest disdain for knowledge management. These people are the most talented, so clueless curators of these junkyards badger employees to enter what they know into the system, even though few people in the company actually use information.

Knowledge-management programs have problems because their designers have false beliefs about how people turn knowledge into action. One fallacy is that knowledge is a tangible *thing*, like a stock or quantity of merchandise that can be separated from the use of that *thing*. This belief leads to wasted effort when leaders decide that knowledge should be "managed" by a group that knows a lot about technology but little about how people actually use knowledge on the job, who needs what information and in what form they find it most useful.

A second problem is that data warehouses are useless for capturing "tacit knowledge," those job skills that can't be translated into words, numbers or drawings and that can only be learned by watching and doing the work. Tacit knowledge is more critical to successful task performance than explicit knowledge in almost every job, from police work to heart surgery.

A third problem is that knowledge is of little value unless it is turned into products, services, administrative innovations and process improvements. These are things that such systems can't help with and that knowledge management per-

ROBERT SUTTON is a professor of organizational behavior at Stanford University's School of Engineering. He and Jeffrey Pfeffer recently wrote *The Knowing-Doing Gap: How Smart Companies Turn Knowledge into Action* (Harvard Business School Press). Contact him at bobsut@leland.stanford.edu.

sonnel usually don't know much about.

Knowledge management systems work best when the people who generate the knowledge are the same people who store it, explain it to others and coach them as they try to implement it. Hewlett-Packard's Strategic Planning, Analysis and Modeling group members, for example, use electronic systems for storing past lessons, but they treat it as a reminder of what they have thought and done rather than an accurate historical record. Corey Billington, the head of this group, describes his job as "part librarian, part consultant and part coach." His group has been successful at transferring skills about supply-chain management, which has been implemented at many HP divisions, because the people who do this internal consulting are also responsible for storing and disseminating this knowledge in the company.

These systems are not inherently useless, but they often fall into the hands of the wrong specialists. The systems should be managed by people who are charged with actually *implementing* what is known, not those who understand information technology but who have only a dim understanding of what the company does and needs to do. ◗

MICHAEL CUSUMANO

Can we measure performance in programming?

I BEGAN STUDYING software development in 1985 and soon learned that various studies indicated enormous variations in programmer productivity. Your best programmer might write 10 or 20 times the amount of code as your worst programmer in the same amount of time.

I then became interested in measuring *performance* and launched a study of U.S. and Japanese software projects. At the time, packaged software sales for PCs were small, compared with large-scale custom systems for mainframes and minicomputers, especially in Japan. It made sense to measure performance in what I call *physical* terms, such as counting lines of code written by programmers in set amounts of time.

Pretty soon, though, I found that you had to keep adding "control variables" to make sense of the data. We adjusted the results by programming languages and separated the data into similar "buckets," such as operating systems, database applications or real-time systems, to account for

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system complexity. Then we had to deal with programmer experience, system size (bigger systems can take longer to code and test), tools (program generators or reuse libraries could add enormously to productivity) and reuse and error levels. As I wrote in *Japan's Software Factories* (Oxford University Press, 1991), the Japanese had higher productivity (more code per programmer per day, albeit with better reuse levels) and better quality (fewer defects) than U.S. programmers. But were they really more productive? No.
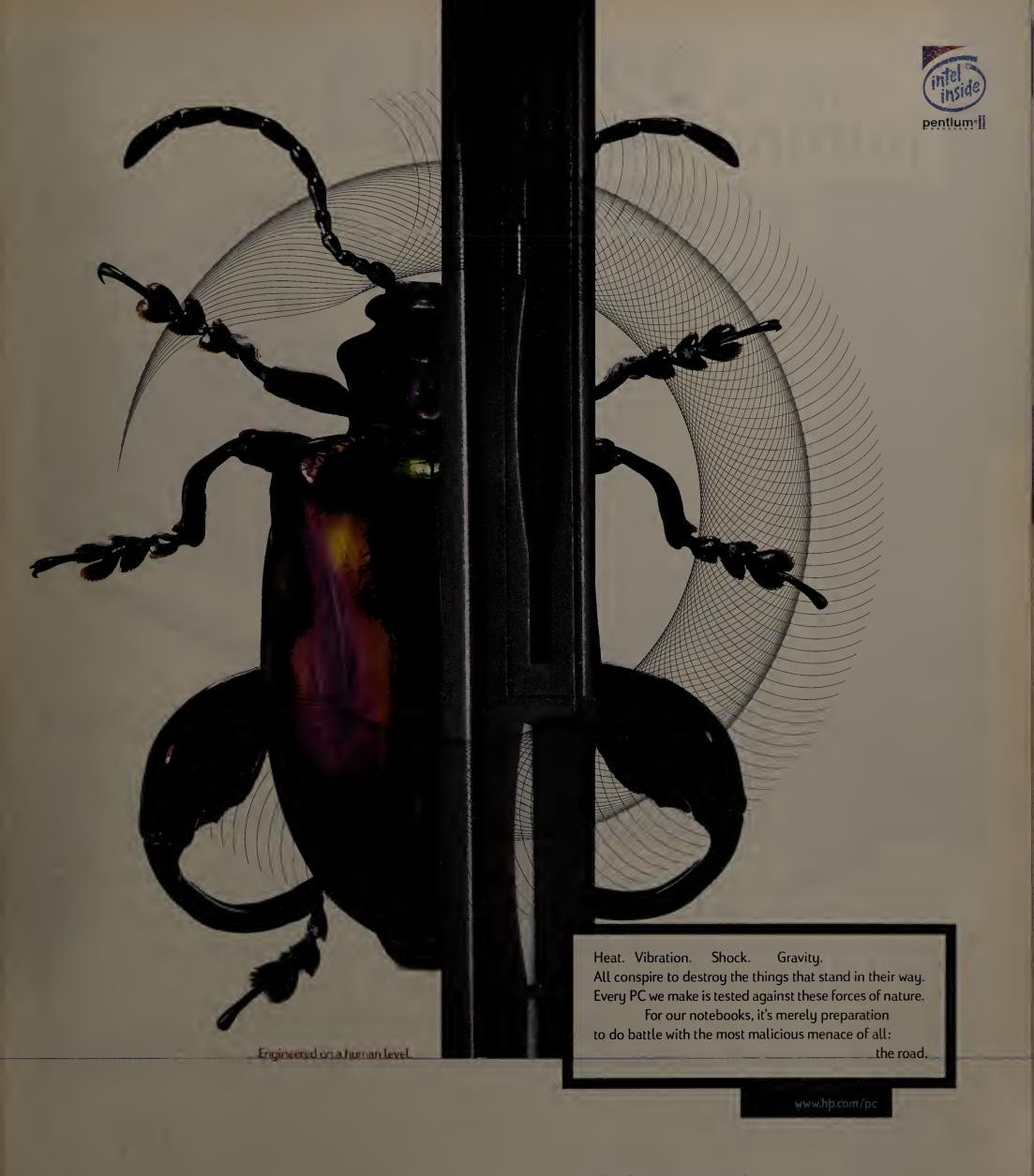
I also remember reading about IBM and Microsoft when they worked on OS/2. IBM wanted to share costs based on the amount of code delivered by programmers each month. When Microsoft took extra time to reduce lines of code to make the product run faster, IBM declared that Microsoft had "negative productivity" and owed IBM money. Microsoft people called the IBM approach of gathering hundreds of "mediocre" programmers to generate huge amounts of code "masses of asses programming." IBM has evolved, but it never did learn how to develop PC software for the mass market. Neither have the Japanese.
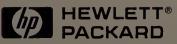
Counting lines of code or using another measure that takes complexity into account, like function points, may still be useful sometimes, such as when comparing programmers creating very similar applications. But what do we do when one company takes twice as long to develop a similar software product, then sells 10 million times as many copies? Physical productivity is almost irrelevant. We should be able to measure this other kind of productivity in *economic* terms — such as sales or profits per programmer.

This measure, though, also has problems. It penalizes companies with weak marketing and sales organizations or the inability to bundle products. PowerPoint, for example, generated minimal sales before Microsoft introduced Office. Bundling this product with Word and Excel to create Office, which now produces billions of dollars in sales and profits, made the PowerPoint team enormously more productive in terms of sales per programmer. Then we have "free" software, like Internet Explorer, Netscape Navigator, Apache and Linux. We can't easily measure economic productivity for products that have no price.
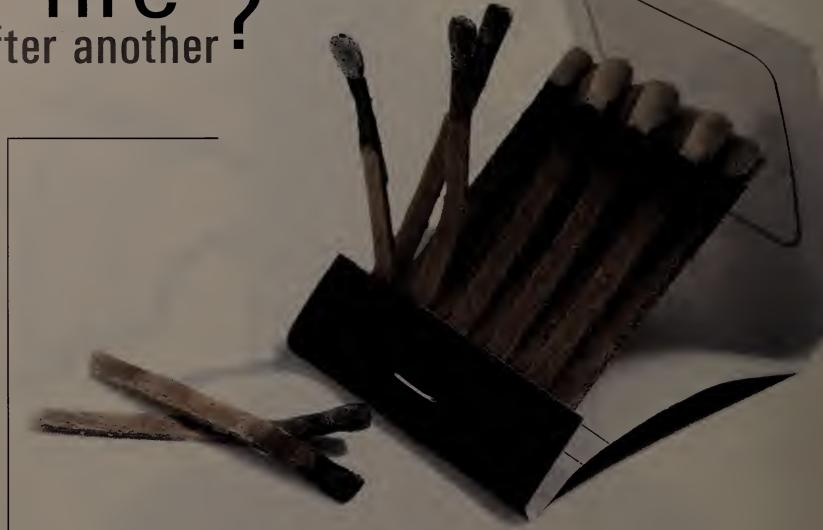
I'm now doing another software development survey, and I still want to link development process to market performance. But after 15 years, I concluded that there's still no good way to do this. The same software product could be like a bridge that everybody has to use — for a fee, or for free. Or it could be like a book — on the best-seller list, or on the leftover table.

I have concluded that, to interpret performance in software development, we need both physical *and* economic measures, as well as information on the organization and market context. I also believe that the economic measures are, by far, most important. Metrics that encourage programmers to write lots of code very carefully do simply that: They encourage lots of code and few bugs but not necessarily "successful" products in terms of market performance. That's the real "bottom line." ◗

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BUSINESS

IS E-BANKING PROFITABLE?

It's been five years since Internet banking began to take off, and the jury's still out on its impact on banks' bottom lines. Some analysts say many banks are creating products that unintentionally lure unprofitable customers. **▶ 33**

GLOBAL E-SALES

New logistics software does just fine crunching numbers to calculate the cost of shipping goods overseas. The big question about the software is whether the vendors developing the applications can collect accurate duty and tariff data and keep the information up-to-date. **▶ 35**

IT CHALLENGES

In an economy where growth is often more important than profits, staying at the top of the CEO's agenda is a survival skill for IT departments. This year, you'll have to cut costs to help fund new initiatives and figure out if you have the employees and vision to make IT an integral part of the company, Jim Champy writes. **▶ 89**

HOW TO HIRE FOR E-COMMERCE

Eric Kidd, chief technology officer at start-up Petsmart.com, spends nearly two-thirds of his typical 70-hour week just on recruitment. Learn from him. *Computerworld*'s Annual Hiring Forecast shows that hiring will go up

13% this year, increasing demand for already scarce tech pros. **▶ 90**

YOU STILL NEED CONSULTANTS

Many companies used consultants to get their ERP systems installed; now they actually want to use their systems. This year they'll demand different skills from consultants, including help managing customers and making better use of data. **▶ 94**

SAFEGUARDING INTELLIGENCE

Intellectual property laws are difficult to enforce in a world where employees job-hop and operations can be exposed to customers online. Users are worrying about the security of code, algorithms and customer databases. **▶ 98**

NET SLAVES

Many employees are throwing their lives away in hopes of cashing in on stock options that may be worthless. The book *Net Slaves* discusses the risks and lack of rewards in the world of Web start-ups. **▶ 89**

IT AGENDA 2000

We've got the top projects you should be working on this year, pitfalls to watch out for and critical success factors to getting them done. **▶ Following page 36**

JEFFREY CAMP

SAVE MONEY THE OLD-FASHIONED WAY: Gerald Stevens Inc. CIO Steven Nevill says the strongest cap on IT costs comes from discipline and fiscal management

IT'S 2000 BUDGET RESOLUTIONS

POST-Y2K, IT managers are faced with the question of what to do once their budgets are freed up. A *Computerworld* survey shows that one-quarter will increase spending on new strategic projects. But others, like CIO Steven Nevill (pictured above), will continue to keep IT costs down through good old-fashioned discipline and strong fiscal management.

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The horizon transforms

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BUSINESS

Are Online Banks Profitable?

Web banks may be luring the wrong customers

BY THOMAS HOFFMAN

CAN BANKS make money online? It's a question that has been dogging the banking industry in the five years since Internet banking debuted.

"It was — and still is — a legitimate question," said William B. Harrison, president and CEO of The Chase Manhattan Corp. in New York.

Banking analysts said it's impossible to generalize about whether Internet banking has been profitable since there are so many ways to measure profitability (by customers or by products, for example). A few banks' Internet-based services have been profitable, such as online bill payment. But "for the majority of institutions, the Internet is not profitable in and of itself," said Richard Bell, an analyst at TowerGroup in Needham, Mass.

Even Web-banking leaders like Wells Fargo & Co. can't say for sure. Because the bank's 1.4 million online customers also use myriad other channels — including stand-alone branches, branches in supermarkets and automated teller machines — measuring the profitability of the business they do specifically online is difficult, said George Cheng, senior vice president of the online financial services division at the San Francisco-based bank.

Cheng said the bank's most profitable online customers match an enticing demographic, with incomes averaging $75,000 and educations higher than the average Wells Fargo customer.

But some banking experts said it's a fallacy to conclude that most Internet banking customers will be profitable.

"Who signs up for free PCs in exchange for advertising? Price-sensitive customers, that's who. And how much money are [banks] going to make off these people?" said James McCormick, president of First Manhattan Consulting Group in New York. Although that group represents only one subset of Internet banking customers, McCormick estimates that roughly 70% of all Internet bank accounts are unprofitable. He said that's due, in part, to the fact that most banks have created services that unintentionally lure unprofitable customers. For example, in the 1970s and 1980s, banks sank millions into developing 24-hour telephone banking centers that were used primarily by their least-profitable customers, to check account balances, not to buy new products.

"Adding channels added costs but not necessarily [profitable] sales volume," said P. Jan Kalff, chairman of ABN Amro Holding NV in Amsterdam.

Others hope retail Internet banking will deliver more lucrative returns. For example, one-third of the Web surfers who visit Security First Network Bank are prospects, said Eric Hartz, president of the bank, which holds $300 million in assets. The Atlanta-based bank, which garnered Gomez Advisors Inc.'s highest overall customer satisfaction rating for an Internet bank (see chart), focuses on customer service, said Hartz.

Security First tries to think "six steps ahead" of questions a customer or potential customer might pose on its Web site to resolve a bill payment or to open a checking account.

Representatives in the bank's multimedia call center will also assist customers who are having problems with their Web browsers, even though it's not one of the bank's traditional services, Hartz said.

Wells Fargo, which Lincoln, Mass.-based Gomez ranked No. 2, also focuses on customer service. To help make Internet banking easier, Wells Fargo holds frequent customer focus groups to get feedback on everything from graphical user interfaces to navigability of its site, Cheng said.
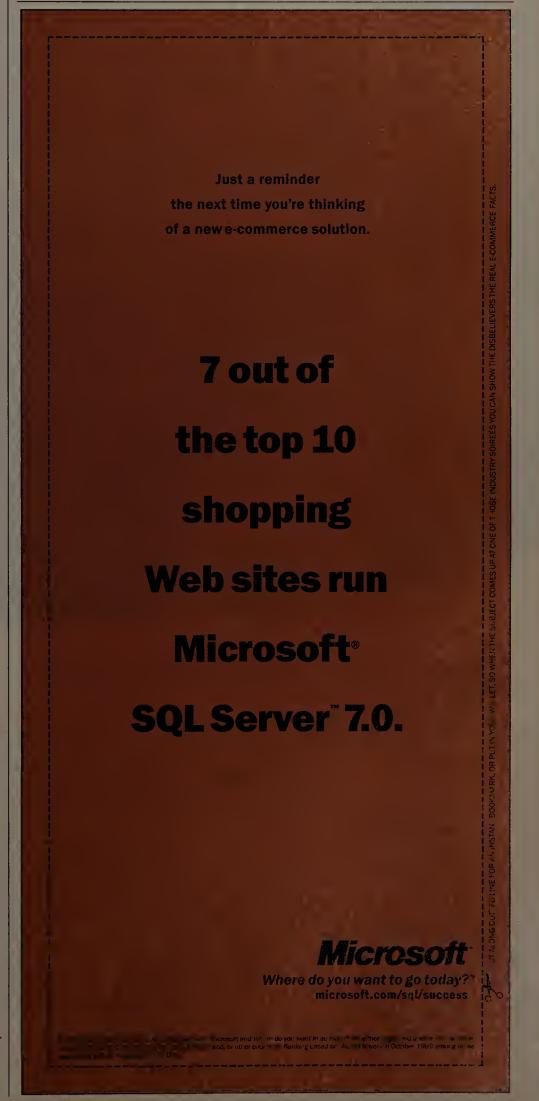
Another challenge for old-time banks that offer Web services is that banks operating only on the Internet don't have to support brick-and-mortar branches, so they can offer more attractive interest rates, said Mike W. Boland, chairman of Newfoundland & Labrador Credit Union in St. John's, Newfoundland.
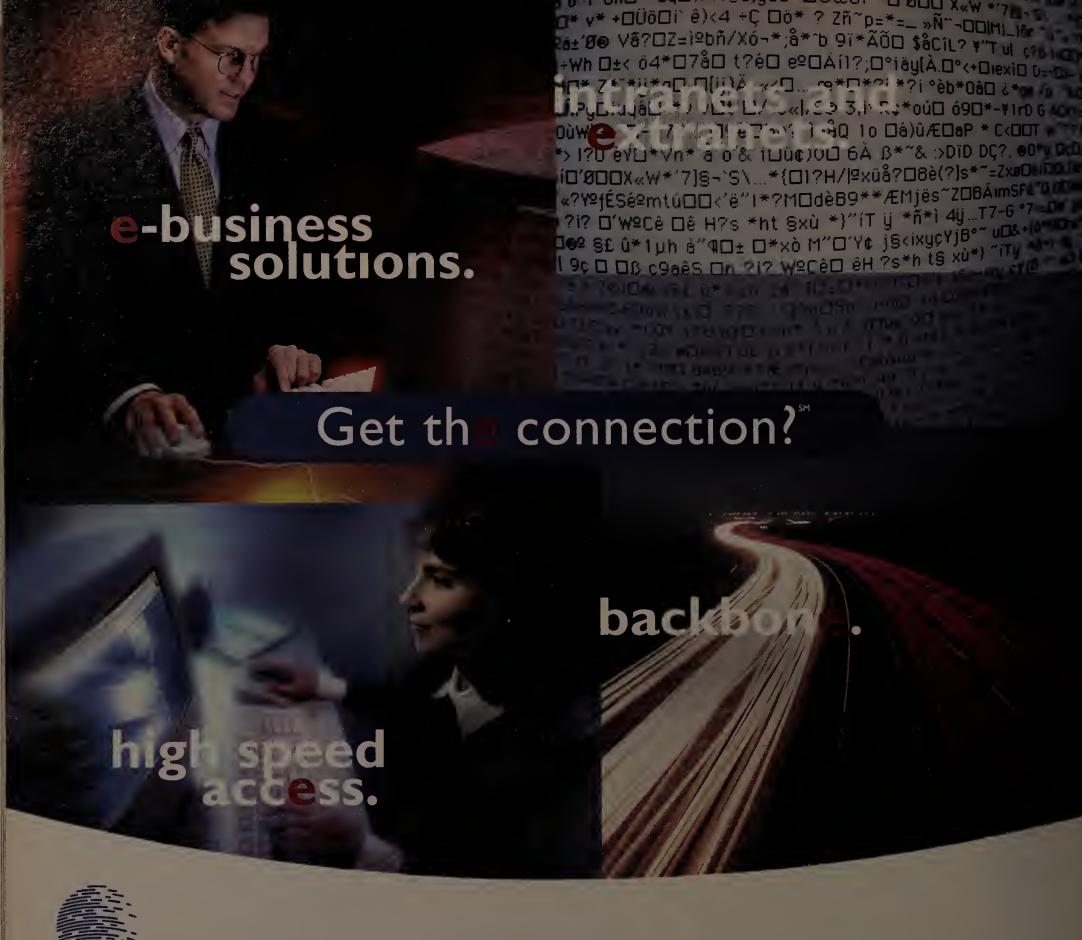
Some industry executives said it's unfair to judge the success or failure of Internet banking after just a few years. For example, Citigroup Inc. in New York, which has been engaged in Internet banking since 1997, has a lofty goal of acquiring 1 billion worldwide customers by 2010, primarily through electronic channels. At present, the bank still has roughly 900 million to go.

"It takes time to move to critical mass," said Citigroup division executive Josh Grotstein. ▶

How the E-Banks Rank

Fall 1999 customer satisfaction scores (10 being the highest possible score):

BANK	SCORE
1. Security First Network Bank	7.16
2. Wells Fargo	6.61
3. Net.B@nk	6.41
4. First Internet Bank of Indiana	6.34
5. WingspanBank.com	6.17
6. CompuBank	5.97
7. BankOne	5.96
8. Citibank	5.93
9. USAccess Bank	5.82
10. Huntington	5.81

SOURCE: GOMEZ ADVISORS INC., LINCOLN, MASS.

Tariff Apps Aim to Ease Overseas Sales

But ensuring data accuracy won't be easy

BY CRAIG STEDMAN

AS THE BIG package carriers start testing new software to calculate the full cost of shipping goods overseas, the key question isn't whether the applications can crunch the numbers they're fed.

It's whether the oft-changing international duty and tariff data the software vendors are gathering will be accurate enough to produce realistic cost estimates for online retailers and other companies that do business on the Web.

"Calculating the cost is the easy part," said Rick Sponholz, global e-commerce product manager at United Parcel Service of America Inc. in Atlanta. "That's just kind of like adding a couple numbers together. The hard part is gathering and maintaining all the data that's out there."

The burden of collecting tariff and product-classification data from dozens of countries falls on the shoulders of several small software vendors that are developing the new calculation engines and pairing up with UPS and its delivery rivals [News, Dec. 20].

The goal is to give online retailers the ability to automatically calculate so-called landed costs — what products will really cost foreign buyers once all the extra charges are added. That kind of calculation is a nightmare now, prompting many Web-based businesses to hold off on taking international orders.

Getting the required data is also a manual slog for the vendors. New York-based Syntra Technologies Inc. and NextLinx Corp. in Silver Spring, Md., each have at least 15 employees working full-time to collect duty and tariff information and to update it daily.

Both companies plus a third, Vastera Inc. in Dulles, Va., are starting small by building in support for a limited number of countries (see chart). They also plan to run the calculation software on their own servers and provide access to it via the Internet, so users don't have to download the updates.

Even with all that attention, the data's accuracy still needs to be tested to see "how well [the software] calculates things compared with what actually happens" in customs offices, said Michael Comstock, senior vice president of planning and e-commerce at DHL Airways Inc. in Redwood City, Calif.

During the first quarter, DHL plans to launch several 90-day pilot projects using Syntra's landed-cost calculation engine to see whether its results are accurate enough to rely on for guarantees on overseas delivery costs, Comstock said.

Sources said UPS is embarking on similar tests of NextLinx's landed-cost application, while FDX Corp. in Memphis is working with Vastera.

Shipping overseas can add a big amount to a product's price tag. For example, even the price of a 250-tablet bottle of nutritional-supplement pills can increase 25% on shipments to countries such as Germany, according to Healthy Discounts, an online retailer in Austin, Texas.

But even if the vendors do get the data right, a potential problem looms: Different customs offices in the same country sometimes classify products in different ways, which means multiple tariff rates could be applied to a single product, depending on where it enters the country.

"At best right now, what you're going to get [from the software] is still an estimate," Sponholz said. ▶

> ## Calculating the cost is the easy part. . . . The hard part is gathering and maintaining all the data that's out there.
>
> RICK SPONHOLZ, GLOBAL E-COMMERCE PRODUCT MANAGER, UPS

Start Your Landed-Cost Engines

A status report on rival applications for calculating overseas delivery costs:

- **NEXTLINX:** Software that can handle shipments among 20 countries is being tested by one user. The number of supported countries is expected to increase to 70 by midyear.

- **SYNTRA:** A landed-cost calculator with support for 12 countries is expected for beta-testing late this month and is scheduled to ship in March. Support for 50 countries is planned by midyear.

- **VASTERA:** Software with built-in support for 25 countries was released for testing last fall. Two more releases supporting a total of 15 more countries are expected by the summer.

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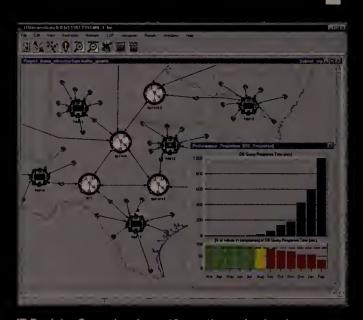
- ☑ Prepare for Windows 2000
- ☑ Plug the Brain Drain
- ☐ Expand ERP Beyond The Back Office
- ☐ Conduct a Y2K Post-mortem
- ☐ Experiment With Voice Recognition
- ☐ Evaluate the ASP Phenomenon
- ☐ Answer Customer E-Mail Fast!
- ☐ Keep Hackers Out Of Your Web Site
- ☐ Resurrect IT Projects Stalled by Y2K

For IT Leaders: What to Do & How To Do It

EDITOR'S NOTE

L **ET ME GUESS:** You made a resolution to get more organized this year. And you got a Palm in your holiday stocking.

Well, you've come to the right place because we've got a lot of material to help fill up that electronic organizer. It may need more memory already.

We're taking a different approach to our year-end issue by offering what I like to call a giant to-do list. We've identified more than a dozen IT action items that ought to be plugged into your agenda – from experimenting with voice recognition to moving ERP beyond the back office.

Now that you've got much of your Y2K work behind you, it's time to do a post-mortem to see what you've learned and to dust off IT projects that were shelved. For example, there's a huge pent-up demand for e-commerce initiatives, so columnist Peter G. W. Keen provides some strategic advice on how to become a true leader in e-commerce, not a follower. (Hint: Focus more on the commerce, less on the *e.*)

I know, anybody can tell you what you *ought* to do. But we're offering ultrapractical advice from your peers on how to go about it and avoid the pitfalls. Spend a little time in these pages and you'll learn how to save money with server consolidation, prepare for Windows 2000, keep hackers out of your Web site and answer customer e-mail – fast.

Plus, each major agenda item comes with a list of three critical success factors – ignoring these could be a career-limiting move.

By the way, dozens of employees are coming back from the holidays with shiny new Palms, too, so don't miss our story on how to prepare for the flood of handheld devices.

And best wishes for the new year!

Mitch Betts

Mitch Betts

CONTENTS

First generation e-business seems pretty smart already, but Intelligent E-Business moves your customers into the fast lane.

First generation e-business lets travelers book flights online. That sure beats the old way.

Intelligent E-Business lets airlines call ticketholders with real time information on flight changes, suggest alternatives and let them use their keypad to book choices... all in the same automated call. No lines, no waits. Customers are happier.

First generation e-business gives e-stock traders nice graphs. Very colorful.

Intelligent E-Business lets firms run continuous multiple analyses of client portfolios, alert them by pager with time-sensitive opportunities and let them buy or sell instantly with the press of a button. No missed profits, no regrets. Customers are richer.

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The Power of Intelligent E-Business™

BY PETER G. W. KEEN

HERE'S A SIMPLE definition of leadership in electronic commerce: Take your company to a place that no one expects it to go.

As with the emergence of PCs, there are many aspects of e-commerce that don't need leadership. Simple common sense — the obvious need to grow your business, the clear-as-day competitive pressures confronting you — will inevitably push your company into developing intranets; establishing Web sites of varying types, scale and complexity; and considering becoming a portal. The companies that initially ignored Internet commerce or dismissed it as hype will move to catch up.

But leadership in e-commerce is a very different matter from catching up. For a company to become a leader, someone has to create a discontinuity. Someone has to step out and be an informed evangelist for a jump-shift in the firm's e-commerce thinking and priorities. That individual has to mobilize the executive team, which then must mobilize the organization. This isn't something information technology, the marketing department or even the CEO can achieve alone. The fundamental challenge of e-commerce is fitting all the pieces together: marketing, technology, process integration, finance and operations.

So for IT to be part of the leadership process, it will need to add value to a number of business-technology dialogues. Here's what I see as the

[OPINION]

WHAT E-COMMERCE LEADERS MUST KNOW

For IT departments to take a leadership role in e-commerce, they'll need to become experts in the following business functions:
1. Perfecting the company's logistics and supply chain.
2. Perfecting long-term customer relationships.
3. Harmonizing all channels on behalf of the customer, so that brick-and-mortar stores, call centers and the Web work together and aren't in a state of "channel conflict."

4. Transforming capital structures and margins, so the firm offsets the heavy marketing and technology costs required for e-commerce leadership. That's accomplished through high-margin repeat business, sufficient working capital and overhead reduction.
5. Building powerful online brands.
6. Looking for opportunities to create value-adding intermediary services, such as industry hubs and information and advisory services. – *Peter G. W. Keen*

e-commerce leadership agenda for IT leaders:

Think *c* - commerce, not *e* - electronic. E-commerce isn't just about Web sites. There are six general value generators that drive the business models of e-commerce leaders (see above). They all concern relationships, community building and business process design. IT can't take a lead if its managers and staff aren't fully knowledgeable about what's going on in all these areas. Why should anyone listen otherwise?

At many firms, marketing is taking the lead in e-commerce, and new business units or even independent dot-com subsidiaries are being created to address it. Will IT be on the outside looking in as these operations look to consulting firms for a combination of business and technology expertise?

Guarantee the integrity of the IT transaction platform. The business side of e-commerce is guaranteeing the integrity of the customer and supply-chain partner relationship. But when the platform is down, so is the relationship, and the customer/ supplier trust bond is at risk.

It's in this area that companies need a capable, smart internal IT function. While electronic commerce rests on building and sustaining relationships, these in turn depend on the reliability, security, scalability and availability of your online transaction factory. That factory must be as sturdy as the Rock of Gibraltar, despite very volatile and uncertain customer demands, transaction volumes and range of services.

The term *scalability* has replaced integration as the key descriptor of the quality of the enterprise IT platform. We've seen many well-publicized failures in scalability and reliability recently, such as eBay Inc.'s daylong outage that cost it billions of dollars in market capitalization and Charles

IT's Agenda for

E-LEADE

SPECIAL REPORT IT AGENDA 2000

Schwab & Co.'s shorter but relatively frequent crashes. I'm also thinking of Encyclopaedia Britannica, whose free site was so overloaded on its very first day of operation that the service had to be suspended, with only an apology from the CEO showing up on the site.

When e-commerce is your company's business, not a sideline on a Web site, reliability is vital to sustaining relationships.

Someone has to take charge of the enterprise technology resource for electronic commerce. Why not internal IT? After all, many of the new generation of developers who know Web site design, Java, Extensible Markup Language and the like aren't experienced in the complexities of large-scale, mission-critical, bet-the-commerce online operations. They also don't have the vendor contacts or the breadth of knowledge across the many components of the technology platform that corporate IT people do.

Build your strategy on collaborations. You are only as strong as your weakest ally. No one can go it alone.

Just about every aspect of e-commerce rests on collaborations — with customers, supply-chain partners and portal partners and service providers that complement your offers, such as shippers, credit providers, information resource providers and many others. In the area of technology itself, the new rule is collaborate or die. Think of the demands e-commerce puts on IT: the software, hardware, data and telecommunications components, the quicksilver pace of change and the need for integration and scalability, as well as the emergence of wireless technologies, voice over IP, object-based tools, dynamic catalogs and software agents.

These requirements and technologies stretch the skill base of any company, including the best vendors. They all demand collaboration between

builders and users. They all involve the business and the technology elements of sourcing, relationships, contracting, information-sharing, joint planning and finances.

Without an IT organization that is central to these dialogues and able to help make informed, expert judgments, a firm can only follow, not lead, in electronic business.

Get ready now for a transformation of the entire IT architecture. Electronic commerce has to be built from the customer back to the company and based on the customer's preferred tools. Today's distributed computing architectures are inadequate for tomorrow's business practices.

For well over 20 years, the mainstream of IT enterprise architectures has been based on distributed computing, centered on the main corporate processing systems, data resources and network complexes with more and more middleware gluing them together. That basic design is poorly suited to the rapidly emerging next generation of e-commerce, which will be based on wireless and mobile devices, agents roaming the network, Internet appliances everywhere, IP voice merging with IP data and massive new demands for scalability. This is the technology leadership priority. Without such leadership, a firm will be locked into a technology base that is rather like New York's JFK Airport: outmoded, cumbersome, maladapted to today's needs and woefully inadequate for meeting tomorrow's business necessities, let alone its business opportunities.

Above all, take the lead in building dialogues everywhere. None of this is at all easy. From my own research while teaching and consulting, I estimate that at most, 5% of IT organizations are well-positioned to take this lead. Electronic commerce will move on without

them, but it will move much faster and deeper if they can make the shift.

This all comes down to dialogues. IT needs credibility, shared understanding and joint commitment across the enterprise, especially at the middle and senior levels of the lines of business.

The dialogue rests on IT showing that it understands the business imperatives and best practice of e-commerce and that its colleagues can trust its judgment about the link between the business issues and technology requirements. IT must show it knows how to work collaboratively with its technology partners and with the technology units of the firm's own business allies.

If IT doesn't show these competencies, there are two likely outcomes. Either the business e-commerce leaders go outside for dialogue, or there's no leadership, just a follow-the-pack attitude. But isn't e-commerce the long-awaited, much-heralded goal of IT for at least the past 20 years: to use IT as a primary source of competitive strength, business innovation and organizational productivity? If so, why not take the lead? It's almost IT's Manifest Destiny to do so. ◗

Keen is chairman of Keen Education, as well as an author and consultant. His Web site is www.peterkeen.com, and he can be reached at peter@peterkeen.com.

> **Someone has to step out and be an informed evangelist for a jump-shift in the firm's e-commerce thinking and priorities.**

Prepare for WINDOV

BY DAVID ORENSTEIN

INFORMATION TECHNOLOGY managers might be surprised just how much work it will take for a large company to upgrade to Windows 2000. Even after the substantial technology leap is made, even bigger political rifts may have to be bridged.

The reason is, unlike the department-oriented Windows NT 4.0, Windows 2000 encourages a centrally managed IT enterprise. In implementations that most fully realize Windows 2000's management benefits, the most obscure departmental or remote users will have to trust central IT to guide their computing experience.

Moving from scores or perhaps hundreds of ad hoc Windows NT domains to the unified hierarchy of Active Directory is like moving from feudalism to the modern republic. With many months of extensive planning, study and forethought, users and analysts say, it won't take as long as that historical shift but certainly will take at least several months.

If the migration to Active Directory can be achieved, users and analysts say, then it will be far easier to reap the other benefits of Windows 2000, such as better reliability, scalability, security and systems management. The early

CRITICAL SUCCESS FACTORS

- ☐ Win the support of senior management and the greater workforce.
- ☐ Study your actual domains and consider them when modeling your Active Directory hierarchy.
- ☐ Test, test again and don't go faster than is prudent.

DIANA BEECHER, CIO at Travelers Insurance: "Whenever you attempt a technological change of this nature, it is the project discipline that really ensures the success"

SPECIAL REPORT IT AGENDA 2000

adopters are each approaching it differently, but there are several steps to the process that appear to work:
- Form a command team.
- Win the buy-in of others.
- Model the enterprise in Active Directory and test it.
- Pilot-test the implementation.
- Don't go faster than you have to.

If a company can properly tackle Active Directory, it can tackle Windows 2000. "The directory is the Achilles' heel of this whole thing," says Joe Clabby, an analyst at Aberdeen Group Inc. in Boston. Active Directory aims to bring every domain, user, computer, printer, application and database into one digital parallel universe of the enterprise, or at least the Windows-based portion of it. Where NT 4.0 at best tied these objects in a loose confederation, Active Directory brings them into one hierarchical structure.

A successful implementation of Active Directory requires implementors to model their entire enterprise, ultimately down to the last user's appropriate network access privileges.

Form a Command Team

One of the best ways to manage the process of migrating is to form cross-disciplinary teams to command it.

At Prudential Insurance Company of America in Newark, N.J., the project has been guided by a team of six working full-time to plan and gauge the impact of Windows 2000. A pair of experts from each function — corporate IT, operations management and security management — meet weekly to discuss strategies and implications. "We resolve the political issues at this level and build consensus," says Laura Gashlin, systems director for emerging technologies.

At Pacific Life Insurance Co. in Newport Beach, Calif., the team is similarly cross-disciplinary, says IT vice president Cameron Cosgrove. Pacific Life, which began its Windows 2000 evaluation last year, has put together a 10-person team with a member of each of its five business units, people from human resources and IT.

Win the Buy-in of Others

The buy-in of top managers as well as end users is critical if the team is to get anything accomplished, users say.

Widespread cooperation is essential because swapping out a company's underlying technology is like that famous magic trick, says Dave Croweak, Windows 2000 project leader at Travelers Insurance Co. in Hartford, Conn.

"It's kind of like doing the tablecloth

DAVE CROWEAK, Windows 2000 project leader at Travelers Insurance: "It's kind of like doing the tablecloth trick – nobody escapes"

WINDOWS 2000

trick — nobody escapes," he says.

Sure enough, his CIO, Diana Beecher, took personal responsibility not only for making a strategic bet on Active Directory, but also for managing the planning and the rollout.

"Whenever you attempt a technological change of this nature, it is the project discipline that really ensures the success," Beecher says.

Greg Speer, project manager for the NT domain architecture team at Texas Instruments Inc. in Dallas, is at least a year away from helping implement Active Directory at the 17,000-user semiconductor and instrument company. But he is already grappling with the politics of Active Directory.

As a widely distributed company of technology-savvy engineers, TI has seen a zoo of domains spring up, including many "rogue" domains established without the knowledge of corporate IT managers. Speer is trying to bring the rogues back into the fold as he consolidates Windows NT 4.0 servers. This cleanup will greatly ease the implementation of Windows 2000 but will also require a three-pronged strategy.

First, Speer plans to sell department managers on the idea that central IT management doesn't have to mean less secure data. Although Windows NT 4.0 out of the box would provide an open window to the rest of the network, it can be closed off with a little work.

He will also fight the myth that giving up control of the domain will mean giving up timely account maintenance to an unresponsive central bureaucracy. Even when NT 4.0 servers are managed centrally, the central IT managers can give local managers authority to create accounts.

If pecking away at provincial fears hasn't brought about the consolidation, then TI's upper-level IT managers will have to send out a stern note, Speer says. The final straw, if needed, will be that rogue domains won't be able to access any enterprise resources because Windows 2000's new security model will shut them out.

Model the Enterprise In Active Directory and Test It

If users understand how their company is structured hierarchically, then its NT domains can be consolidated into an Active Directory hierarchy.

Croweak at Travelers, which began planning its Active Directory enter-

prise structure in June, was by October confident enough to declare: "It laid down very nicely as far as a hierarchy that matched our business units."

The company's previous approach to domains was to maintain development, quality assurance and production versions in each of its six business units. By consolidating the domain "trees" under one Active Directory "forest," it can pare the domains to maintain down to three from 18. But users need to get a sense of whether Active Directory will really scale to accommodate their entire enterprise.

At Prudential Insurance, IT is already well-centralized, Gashlin says, but Active Directory has still been time-consuming to implement. As a member of Microsoft's Joint Development Program, Prudential has been working for more than a year to prepare for Windows 2000. In October, the company was still testing the best ways to model its 65,000-user organization in Active Directory. It was also testing Active Directory's ability to scale to between 500,000 and 1 million objects.

To run such tests, Prudential asked a visiting Microsoft consultant to cook up a tool that would let the company test and populate different organizational structures in Active Directory. Third-party tools, such as Managed Migrations from Entevo Corp. in Arlington, Va., let users view all their NT 4.0 domains as if they were aligned hierarchically in Active Directory. Microsoft also licensed software from Houston-based Mission Critical Software Inc. to bring NT 4.0 domains into Active Directory. Another commercial tool made for this purpose is DM Suite from FastLane Technologies Inc. in Halifax, Nova Scotia.

Pilot-Test the Implementation

Of course, testing should apply not only to the concepts and models, but also for the actual rollout. Pilot tests of Windows 2000 in production will be the norm for large enterprises, Aberdeen's Clabby says.

Travelers' plans include a pilot test at two of its field offices, where Beecher notes the core business of writing policies is done, and on the machines of personnel at headquarters who directly support those offices.

The company wants to see clear proof that Active Directory has made its business easier to run, according to Beecher.

At Pacific Life, the company rolled out beta code to some of its production

print servers last fall with great success, Cosgrove reports. Pacific Life consolidated five print servers running Windows NT 4.0 into two running Windows 2000. The two now support each other with load balancing and fail-over capabilities, which improve performance and reliability. The new cluster is running about twice as fast as any of the old five did.

Don't Go Faster Than You Have To

Even Microsoft will tell companies they don't need to rearchitect their entire IT infrastructure on Feb. 17, Windows 2000's scheduled release date.

"You don't need to eat the elephant in one bite," says Peter Houston, lead product manager for Windows 2000. Companies can upgrade Windows NT 4.0 servers to Windows 2000 just for the reliability and performance benefits, without making any changes to their domain structure. After the machines such as the primary and secondary domain controllers are upgraded, the company can migrate the enterprise infrastructure to Active Directory, he says.

A big question is whether users should quickly move to Windows 2000 or wait. TI, freshly done with a rollout of SAP AG's enterprise resource planning software, is in no rush to roll out Windows 2000, Speer says. In addition to its desire to put some space between the IT upheavals, TI is heeding the advice of analysts who say that waiting for a service pack or two will ensure a more stable product.

One of those more adamant about the virtues of waiting is analyst Neil MacDonald at Gartner Group Inc. in Stamford, Conn. Microsoft, hardware vendors and even staffers anxious to add Windows 2000 skills to their résumés will pressure the CIO to upgrade, but "nobody is looking out for the CIO's best interests here," he says.

MacDonald recommends letting Windows 2000 seep into the organization on infrastructure servers such as domain servers, on newly bought client hardware — and only when absolutely necessary on application servers. Clients don't need to be Windows 2000 clients to work with Active Directory and Windows 2000 servers.

Meanwhile, if an SAP server is running at acceptable and stable performance levels, there should be no reason to upgrade it, MacDonald says. Gartner predicts that Windows 2000 installations won't overtake NT 4.0 installations until 2003. ▶

> ## It's a huge learning curve. It's like night and day with NT 4.0 compared to Windows 2000.
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BY LESLIE GOFF

Plug the BRAIN DRAIN

WHEN SCOTT Dinsdale was recruited by First-Look.com, an Internet start-up that combined his passions for music and technology, there was little his employer, Bertelsman Music Group (BMG), could have done to stop him.

The former BMG CIO, who left the New York music label in September, says he was drawn by the chance to build a company from the ground up as executive vice president and chief technology officer at FirstLook. He was enthused enough by the fledgling's promise to be a leading music industry Web site to take in excess of a one-third cut in salary (though he also gets equity) and move lock, stock and barrel from New York to Los Angeles.

"In a dot-com, there's opportunity for real innovation and reinvention. And that pulled at me," Dinsdale says. "I've spent the last eight years in major corporations. But before that, I spent 10 years in start-ups, and that was and will remain my first love."

If someone is predisposed to the temptation of an Internet start-up, the traditional counteroffers — more money, a promotion — are seldom effective, Dinsdale and other information technology managers say. It's a catch-22: You try to hire people who are self-motivated risk takers — and they're just the types who find an Internet start-up appealing. Companies of all kinds are confounded by how to dissuade their IT talent from leaving for a dot-com.

Finders Keepers

So what do you do? Throw your staff the same risk, challenge and change that a dot-com start-up would. "Innovation is key to retention," says Bob Taylor, vice president of the mobile trading project in the Electronic Brokerage group at Charles Schwab & Co. in San Francisco. "You've got to foster creativity and give people a chance to run with their ideas and see them become products."

Schwab's approach to innovation is a viable one: It created its own dot-com venture, says Taylor, a 12-year Schwab veteran and one of the first three people picked to launch the Electronic Brokerage group.

Naturally, you can't create a whole new business just to keep your staff happy. It has to make sense for your company. And you have to balance the talent — you can't pull all your network administrators away from your main IT operations and put them on the dot-com team.

But several companies such as Schwab are finding that they can create start-up Internet businesses that forward company goals, satisfy the people they're in danger of losing and reduce overall IT attrition.

"If you can't beat 'em, join 'em," says David Foote, a consultant who specializes in IT workplace issues and a managing partner at Foote Partners LLC in Stamford, Conn. "Not everyone is after the IPO. They'd rather stay where they're comfortable but challenged."

To make an internal start-up work as a retention tool, you have to create the same environment, Dinsdale says. Offer equity in exchange for lower compensation. And don't guarantee them the chance to return to the parent, he adds: "Otherwise, you just diffuse the culture you're trying to create."

Do What the Dot-Coms Don't

If you can't create your own dot-com, do what a dot-com may not have the resources to do. Cultivate balance between employees' personal and professional lives. Offer telecommuting, flextime and on-site services that make their time easier to manage — dry cleaning, photo finishing, take-out dinners. Demonstrate a commitment to their training and development.

"If people are trying to balance their work life, family life, social life and training, they'll find our environment very attractive," says Lisa Reinitz, manager of recruiting for the Information Technology Services group at Airborne Express in Seattle. "Here, they don't have to put in a 60-hour week."

Nevertheless, Airborne has lost a few IT employees to Internet start-ups. "If they're getting stock options, and there's the lure that the company could be the next Microsoft, you can't do much to stop them," Reinitz says.

As a last resort, make a counteroffer when appropriate. "Don't reflexively grant or deny extra money," Dinsdale says. "Look at their compensation and maybe, given their skills, an increase would be reasonable."
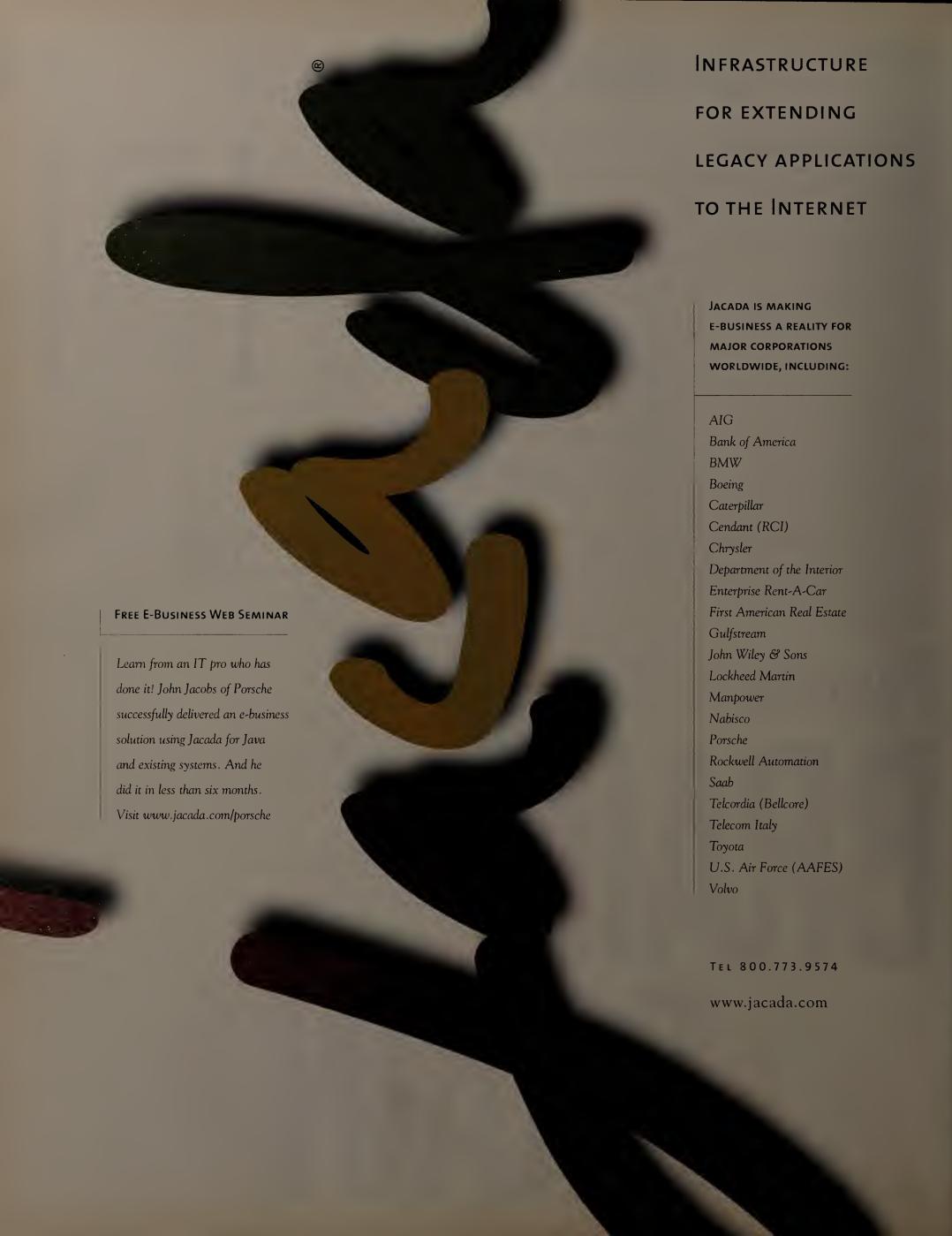
Finally, recognize that some IT staff will join a dot-com regardless of what you do, so leave the door open. "If they're a good employee, we try to make the departure as amicable as possible," Reinitz says. "We say, 'OK, when you're burned out, come back to us.' " ▶

Goff is a freelance writer in New York.

Expand

ERP

Beyond The Back Office

BY CRAIG STEDMAN

YOU'VE MODERNIZED your back-office operations, put your whole company on a common set of applications and fixed those nasty Y2K problems. Now it's time to get some real value out of your ERP system.

It may have taken years of hard labor to install SAP R/3 or another suite of enterprise resource planning (ERP) software that can process orders and run other basic business transactions. But for many companies, that's turning out to be just a starting point. Users ranging from consumer products giant Colgate-Palmolive Co. to Northstar Technologies, a 100-employee division of Quebec-based Canadian Marconi Co., have a new priority: extending their ERP systems into realms such as e-commerce, customer relationship management, data warehousing and business planning.

There are good reasons why you should make plans to join them — anticipated improvements in sales, customer satisfaction and corporate decision-making can go far beyond the internal efficiencies and year 2000 compliance that have been the twin hallmarks of many ERP projects. But add-on applications are required because back-office ERP systems weren't designed to do the kinds of jobs that users are now eyeing, says David Dobrin, an analyst at Benchmarking Partners Inc. in Cambridge, Mass.

The advice from several early adopters is to tread carefully and make sure the add-on software is ready for you, and vice versa. Important issues to keep in mind range from product maturity to the need to avoid overwhelming end users with unfamiliar technology.

For starters, you'll need to decide whether you want to get everything from your ERP vendor or look elsewhere. The latter approach might buy you more functionality, but getting different products to work together is notoriously complex. And with the price of application integration tools easily reaching seven figures, users who need tight integration "are going to pay some serious money for it," Dobrin says.

On the other hand, most of the new applications being released by ERP vendors such as SAP AG have yet to be widely used in real-world settings, making them something of an unproven commodity.

For example, Green Mountain Coffee Inc. last summer was the first user to go live with online sales software developed by PeopleSoft Inc. for use with the Pleasanton, Calif., vendor's ERP applications. Green Mountain eventually expects to double its consumer business and get at least 10% of its wholesale orders online by using the Web, says Jim Prevo, CIO at the Waterbury, Vt., coffee roaster.

But the rollout to consumers hasn't been entirely smooth, prompting Green Mountain to postpone plans to quickly open up its e-commerce site to coffee shops and other wholesale customers. "We were the pioneers, and we did take a few arrows and find some problems," Prevo says. "We're working with PeopleSoft now to show them the kinds of things you need to stay afloat in the real world."

Consumers buying coffee via the Web were able to fill out order forms before the E-Store software downloaded data-validation code to their browsers, resulting in errors that sometimes weren't caught until after an order was placed, Prevo says. Green Mountain had to write custom code that sends error alerts to its webmaster

CRITICAL SUCCESS FACTORS

☐ Make sure new add-on applications from your ERP vendor have enough functionality to meet business needs.

☐ Don't try to do too much at once. Most users start with a single application or with limited rollouts of multiple products.

☐ Ease of use and training should be top priorities, because add-on applications reach new users who may be unfamiliar with ERP systems.

ERP

so customers can be contacted for the correct information.

Three months after launching the online system, Green Mountain was still taking just 25 to 30 orders per day electronically and had put off making a big marketing push for its Web site until the software kinks were ironed out. The company was also giving customers discounts, free mugs and other incentives as thanks "for helping us debug the system," Prevo says.

SAP, the ERP market leader, is selling a wide swath of add-on applications that reach beyond the back-office stronghold of its R/3 software. But new customer relationship management packages were slow to materialize, and its first data warehousing and supply-chain planning tools didn't meet all the needs of prospective users. Upgrades are just becoming available now, some still in beta-test form.

Taking Their Time

That hasn't stopped some R/3 users from installing the new applications, but they're not rushing to do too much, too soon.

For example, Eastman Kodak Co. plans to use SAP's Business Information Warehouse software to build a corporate data warehouse tied to its R/3 system. But an initial installation that went live last spring was a more tactical setup designed to eliminate several mainframe applications that prepared finance and sales reports, says Eric Hunt, manager of the Rochester, N.Y., film maker's data warehousing project.

Raytheon Aircraft Co., a maker of small and midsize planes in Wichita, Kan., expects to augment an R/3 system that's due to go live this month with Business Information Warehouse and SAP's supply-chain planning tools. But after looking at the data warehousing software, the company decided to wait for a second release that went into beta testing in November, says project manager John Ferney.

And it's not just big companies that are approaching add-ons with caution. Northstar Technologies, a 100-employee operation in Acton, Mass., wants to open up the data in its ERP system so dealers that sell its Global Positioning System products for boats and airplanes can track the progress of product repairs online. Jim Bricker, Northstar's information systems manager, says he plans to do that by installing new Web-based software that

his ERP vendor, Pivotpoint Inc. in Woburn, Mass., is scheduled to release by the end of March.

Northstar is also interested in using Pivotpoint's add-on software to let the dealers place orders via the Web. But the timing of that step "is hard to say when we haven't even implemented the first phase," Bricker says. "It depends on how far Pivotpoint has come with the software." Security issues are an especially big concern, he adds.

Taking Small Bites

Biting off more than your end users can chew is another potential pitfall. Dobrin says training and ease-of-use concerns can be even bigger issues with ERP add-ons than they are with the back-office software itself. Why? Because applications such as sales force automation and business analysis may be used by much wider groups of employees.

Assessing how ready your company is for add-ons "requires a certain amount of honesty" on the part of both IT and business managers, he adds.

Dow Corning Corp. is a case in point. The Midland, Mich., maker of silicon-based materials finished an R/3 rollout last summer and is now looking to surround its ERP system with several of SAP's companion applications. But CIO Harry Ludgate says Dow Corning plans to start with limited pieces of the add-on functionality to give workers such as its sales force a chance to get comfortable with the new technology.

"I'm not expecting the users to be all that happy [at first]," Ludgate says.

"They enjoy a challenge like the rest of us do, but you can go too far." Dow Corning's sales and marketing departments also need to develop a consistent set of business processes before SAP's software can be of much use there. "That seems to me to be the real challenge, not the technology," he adds.

New York-based Colgate-Palmolive is further along than most companies. It was one of the first users to turn on SAP's advanced planning software last spring, and it went live with Business Information Warehouse in the fall. The company also is helping SAP design a customer relationship management application for synchronizing production schedules with promotions planned by retailers.

> **[Letting dealers place orders via the Web] depends on how far Pivotpoint has come with the software.**
>
> JIM BRICKER, IS MANAGER, NORTHSTAR TECHNOLOGIES

The long-term plan is to tie everything together so data can flow between R/3 and the other applications in a continual loop of planning, execution and analysis, says Colgate-Palmolive CIO Ed Toben. But for now, the company is only part of the way there. For example, the first data warehousing rollout covered only its U.S. operations, leaving the European and Asian businesses to be tied in later.

And even in the U.S., Business Information Warehouse is initially capturing only a subset of Colgate-Palmolive's sales and financial data. "We're clear in our minds about where we want to get to, but we haven't mapped out all the steps," Toben says. "We're working on the pieces now. Then the next phase will be to integrate things."

Like other users, Cargill Inc.'s food products unit in Minneapolis wants to make sure new add-on software is ready before taking the plunge — by adding a Web-based application that will let customers access data in its inventory and manufacturing systems. The new package, expected by March, is being developed by Cargill's ERP vendor, Systems & Computer Technology Corp. in Malvern, Pa.

But the business payoffs of extending the ERP system — such as better customer service and the ability to work more collaboratively with customers to set production schedules — are expected to be big. "Our business is all about servicing our customers, and we're looking for tools that connect us more closely to them," says Michael Drazen, director of the food unit's IT group. ▶

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BY KATHLEEN MELYMUKA

YOU'VE GOT TO be kidding! That's a common reaction to the idea of a Y2K post-mortem. As year 2000 work finally winds down, the last thing most people want to do is study the project's entrails. "After the date change, we're going to be under a lot of pressure to get moving forward," as one CIO put it, "and there's not going to be a lot of time for retrospection."

But those who move ahead without looking back will miss a golden opportunity because Y2K was more than a money pit. It was a proving ground for new processes and disciplines that can have tremendous value — if they're recognized, institutionalized and carried forward. That's what a year 2000 post-mortem can facilitate.

For example, the folks at Alliant Energy Corp. in Madison, Wis., learned that a post-mortem can transform weaknesses into strengths.

"We did some work on a customer information system a couple years ago and used an outside party to work with us," says Suzette Mullooly, who is directing the post-mortem. "A certain level of knowledge was transferred, but not enough."

As a result, fixing the system for Y2K was more difficult than it should have been. But Alliant staff delved into the system code and came out with a much better understanding.

The post-mortem will document what was learned about the system, and it will also institutionalize better contracting procedures, assuring that in the future contractors will share system knowledge with Alliant staff.

"I see tremendous opportunities for organizations," says Scott Shemwell, a managing director at Enterprise Networking Systems Inc. in Houston. "If I were a CEO, I would demand that my information people get some additional value out of all that. But I don't see evidence of CEOs pushing on them."

Many aren't. And if your CEO isn't pushing, you should be, because the people who have been on the Y2K team have invaluable knowledge that can be leveraged to help with all the challenges businesses face in the post-Y2K arena. "They have a very good understanding of how the company is configured to do work in the Information Age," Shemwell says. "If they will take that knowledge and apply it, they will get an extra bang for the buck."
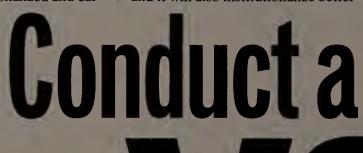
If they don't, he says, "the data will age quickly, and they go back to business as usual."

Some people have been looking for benefits throughout the year 2000 project. At Sears, Roebuck and Co., for example, CIO Gerald Miller has used every Y2K meeting as an opportunity to look for collateral benefits from the project, and he has already incorporated some — such as improved cross-functional project management — into his three- and five-year strategic planning process.

Irene Dec, vice president for information systems at Prudential Insurance Company of America Inc., has also been building in Y2K improvements throughout the five-year project. Even so, she has planned a post-mortem as well, and it's a safe bet that companies that have already gleaned some benefits from Y2K can still get more from a final, focused look.

Just ask David Iacino, Y2K project manager at BankBoston. He and his Y2K staff began the rough work on the post-mortem even before the millennium project was cold, and they have already documented improved processes that can benefit just about every area of the company: "Inventories, testing, clean management, documentation re-

Conduct a Y2K POST-M

tention, accountability, event planning, risk management, teamwork, tools selection, dealing with legal, dealing with service providers, dealing with external entities, dealing with slipping dates when you can't slip the end date, sharing with other banks, retention programs for key people, doing tests via proxy, contingency planning, facilities planning, embedded systems, applications that are being retired, using the Internet in projects, etc., etc.," he says. "And that's just off the top of my head. It has tremendous value."

Those with the fortitude to take a last look can discover where Y2K work spawned new core competencies, put those gains to work in the company and leverage all those Y2K dollars.

Iacino estimates that a thorough Y2K post-mortem would take 1% to 5% of the effort put into the Y2K project. "And the benefits," he says, "are immeasurable."

To determine what you've learned from year 2000, you first need an executive sponsor who understands the value to be gained by the exercise —

and who can grease the gears for one more go-round with Y2K. At Alliant, the executive sponsor is the CEO, giving Mullooly safe passage through the business units.

Break It Into Chunks

The Y2K project leader is the natural choice to lead the post-mortem, and project team members are the natural players. They know where the bodies are buried and already have lots of ideas about benefits to be gleaned.

The scope of a Y2K post-mortem is daunting at first, but you have history on your side. "A couple of years ago, if you looked at Y2K, you'd say, 'How could we possibly do that?' " Shemwell says. "Like anything, you've got to bite it off in small chunks."

But these chunks will take days rather than months and years.

It makes a lot of sense to divide the post-mortem just as you divided the Y2K work, says Ian Hayes, president of Clarity Consulting Inc. in Hamilton, Mass. You might have a supply-chain group, an information technology applications group, help desk, legal, buildings and facilities, human resources, embedded systems or any other functional divisions that make sense in your company. On the other hand, you could break the team into disciplines, as Iacino has done: project management, testing, inventory management, teamwork, communications, vendor management, disaster recovery and sharing best practices.

However you divide the work, each group should follow the same basic process. Hayes suggests an initial debriefing, followed by a detailed examination and ending with a consolidation of various teams' findings.

"The initial debriefing should happen as close as possible to the end of the event — as soon as you hit stability and while it's all still fresh," Hayes says.

The debriefing is a meeting in which the Y2K team discusses impressions,

discoveries and lessons: what could have gone better, what worked great and, most particularly, what is reusable. This should be a classic brainstorming session with white paper taped to the walls and a scribe taking everything down in colored markers.

The detailed examination should take place later, probably around the end of the first quarter, when Y2K has begun to settle and subtle problems have begun to bubble up. The same people now have more perspective, Hayes says, and they should start with an experience-sharing meeting: What was good? What was bad? What went wrong? What went right? What can be used again?

Reusability is key because many Y2K entities can be preserved almost intact for reuse. For example, companies are retooling their Y2K project offices to serve as corporate project offices, and many aspects of Y2K contingency planning are being absorbed into business continuity plans.

The Hard Part

When the brainstorming is over, the real work begins. Combine the notes from both sessions with all the documentation you can get your hands on: project plans and records, test plans and real outcomes, budgets, logs from the transition time. Here you've got a distinct advantage because Y2K may be the best-documented project in history. "Because of all the Y2K legal fears, companies are going to have much more documentation than they normally would have," says Hayes.

Use it to bolster people's impressions with the facts of what went right and wrong in the project. For example, compare test plans and test results with what actually happened. If both the test and the real thing went off without a hitch, you've probably developed some good test processes. If the test was smooth and reality was rocky, though, try to figure out what you missed and
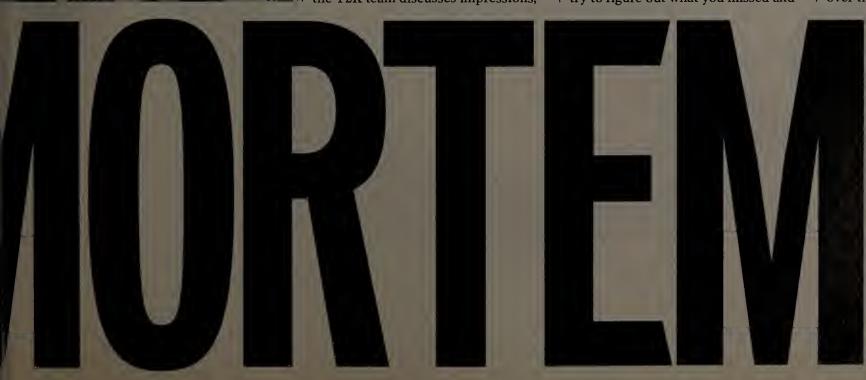
how you might improve the processes.

Each group should distill its discoveries into some good action items (see list above) with fixed responsibilities for follow-up. Iacino's team is writing white papers in each area, outlining what's to be gained by institutionalizing various Y2K processes and describing how to go about it.

Finally, the post-mortem manager should put all the groups' products together in an executive overview for presentation in writing and in person to the top executives of the company. "We will do a presentation for the CEO and each of executive vice presidents and the senior management of each business unit," Mullooly says. "The business units will be responsible for follow-up."

The Y2K post-mortem turns the old "in for a penny, in for a pound" mentality on its head. You're already in for the pound; a penny more can mean the difference between surviving and flourishing.
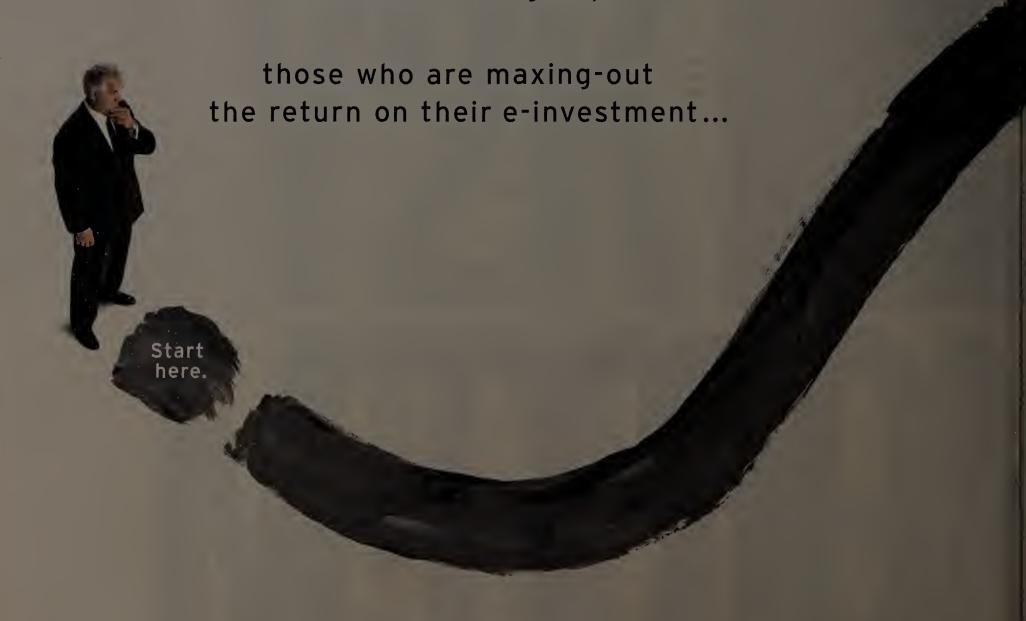
"Any company that lets [these lessons] rot away is incredibly stupid," Hayes says. "In the future, as we get more and more tied together in an e-business world, don't you think there will be other year 2000-like problems? Do we really want to go and do this all over the next time?" ▶
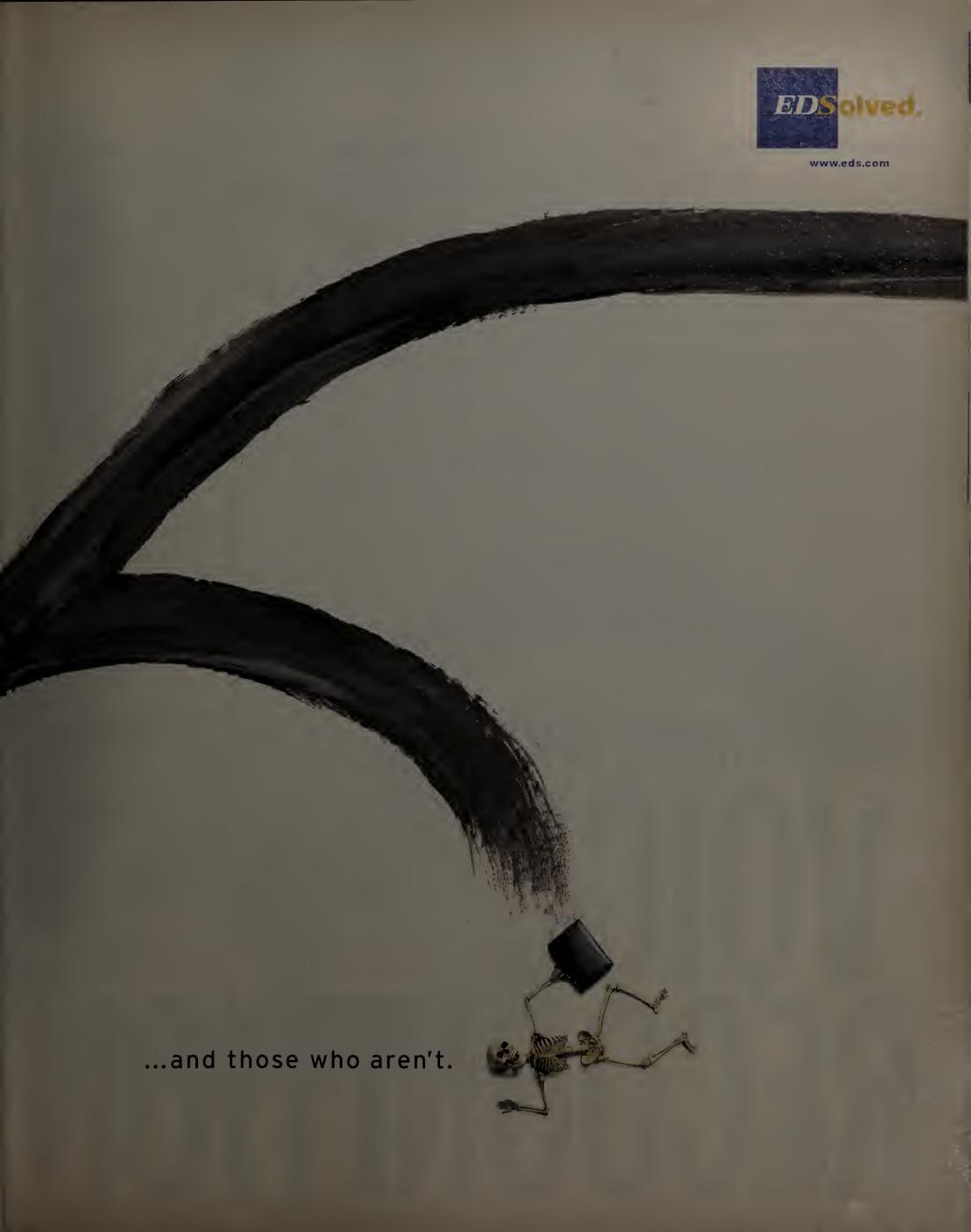
JACK FOLEY

MORTEM

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BY GARY H. ANTHES

I F YOUR COMPANY hasn't yet embraced speech-recognition technology, this is the year to do it.

Give it to that executive who dictates memos to his secretary because he can't or won't type. Give it to the guy who's battling carpal tunnel syndrome and the woman in the lab who needs to record information while her hands are on a microscope. And put it in your call center, where you might eliminate a position or two by processing some calls automatically.

But those who have been there and done that caution new users not to be seduced by the notion that speech recognition is easy. It can be, but only with thorough training and careful practice.

"We see a high dropout rate among people who buy the technology, then abandon it in a few days," says Jackie Fenn, an analyst at Stamford, Conn.-based Gartner Group Inc. The problem, she says, is that speech-dictation products aren't as easy to use as end users expect.

And most people don't know how to dictate. "It's a learned skill, and it may take longer than learning to use the package itself," Fenn says. Getting proficient is more a matter of practice than of formal training and may take a few weeks, she says. She advises rolling out the technology slowly, to a few highly motivated end users first.
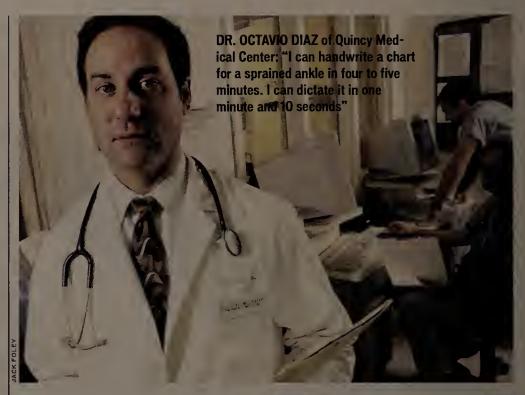
It's also time to begin tinkering with some sophisticated new technologies likely to emerge from laboratories this year. For example, imagine being able to data-mine customer calls that are converted to text and stored in a database as they come in.

BBN Technologies, a unit of Irving, Texas-based GTE Corp., has technology that can recognize the continuous speech in news broadcasts with 85% accuracy, including telephone interviews. That's good enough for business intelligence applications, according to BBN's chief scientist, John Makhoul.

Makhoul says Cambridge, Mass.-based BBN also has technology that transcribes audio from any source, indexes it, identifies speakers and detects numeric data such as dollar amounts and categorizes content by topic. Dragon Systems Inc. in Newton, Mass., and IBM have similar technology, and all three say they will work with beta customers this year.

According to David Nahamoo at IBM Research, IBM this year will introduce technology for "conversational computing," in which users command computers to fulfill orders, respond to account queries, create e-mail or send faxes.

Meanwhile, dictation products just get better. They offer acceptable accuracy if used properly; training the software for your voice now can be done in less than an hour; it's no longer necessary to pause between words; and good packages are less than $100.

Ten physicians at Quincy Medical Center in Quincy, Mass., use software from Lernout & Hauspie Speech Products NV in Ieper, Belgium, to create the medical records of some 32,000 patients per year. The software recognizes their speech and prompts them with templates embedded with medical knowledge.

The system has enabled the center to greatly improve its record keeping, says Dr. Octavio Diaz, chief of emergency services at Quincy Medical Center. It's a time-saver as well. "I can handwrite a chart for a sprained ankle in four to five minutes," Diaz says. "I can dictate it in one minute and 10 seconds."

But he says background noise is still a problem, and microphones have to be carefully placed to minimize errors. User training is a key to success, Diaz says.

Fenn says IT managers should expect some support headaches from remote users of speech products because it may be hard to diagnose problems long distance. "Is it the speech card, the microphone, the microphone placement or the way they are speaking?" she suggests. So gain experience with a product at headquarters before giving it to remote users, she says.

Researchers at Du Pont Co. use speech recognition to enter experimental data while handling instruments. But few executives at the company use it because their laptop computers aren't powerful enough, says David Pensak, a senior research fellow at the Wilmington, Del.-based chemical company.

"But as we replace them with 300-MHz [systems] and above, it will make a lot of sense," he says. ▶

DR. OCTAVIO DIAZ of Quincy Medical Center: "I can handwrite a chart for a sprained ankle in four to five minutes. I can dictate it in one minute and 10 seconds"

JACK FOLEY

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Evaluate The ASP Phenomenon

BY STEVE ULFELDER

EVERYBODY WANTS to rent you applications all of a sudden. Software vendors are tripping over each other to announce they're either becoming application service providers (ASP), partnering up with one or both. ASPs are hot. But you don't care what's hot. You care about what's right for you. Are ASPs a major development for information technology shops? Or are they just another mania created by and for vendors? Here's a cheat sheet to help you stay ahead of the curve in the hype-filled world of ASPs.
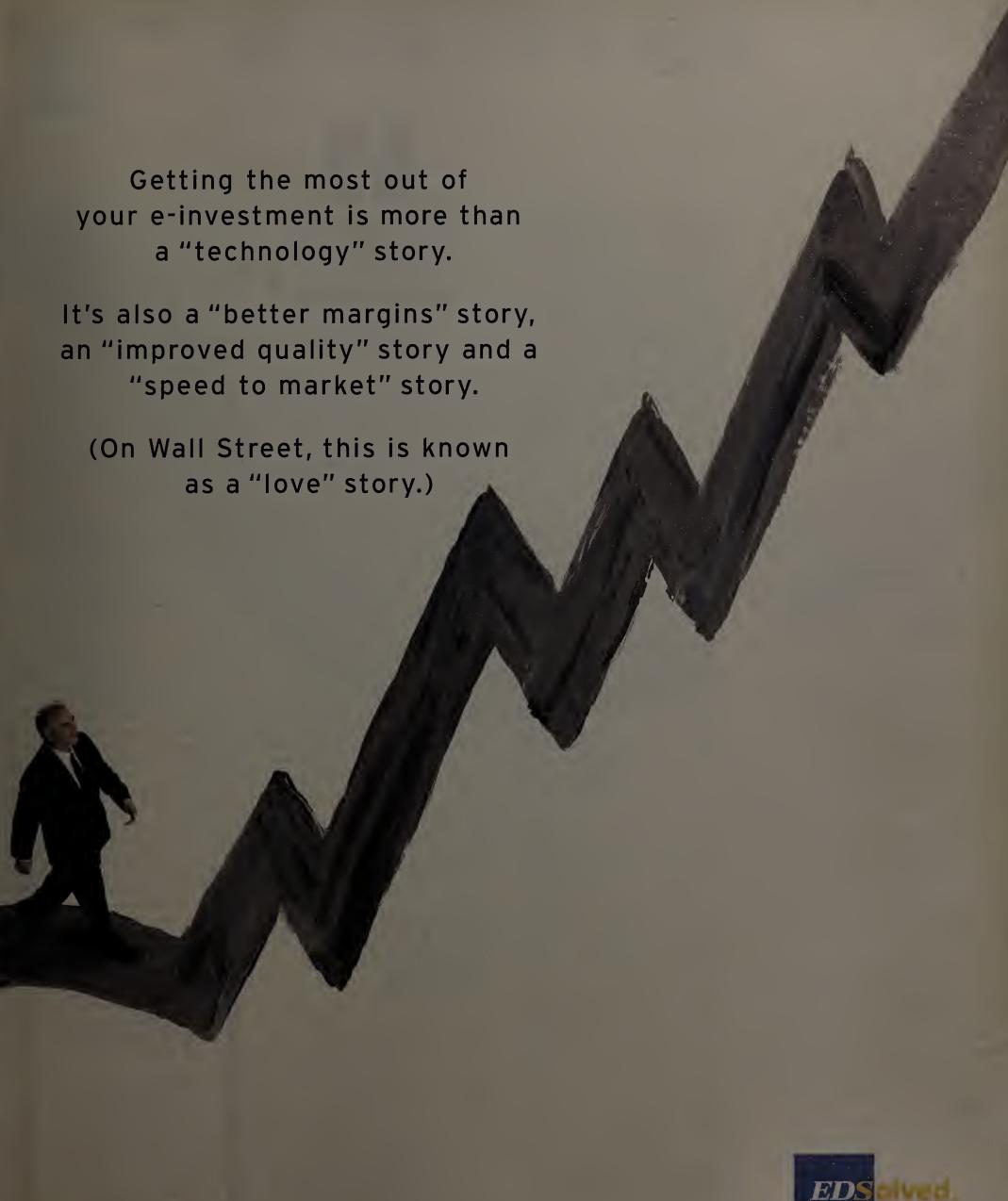
BENEFITS OF ASPS

■ **Focus.** Outsourcing to an ASP lets you concentrate on strategic projects, making money and serving customers, rather than on IT. Future-Next Core Technology Group, a Los Gatos, Calif., company, was overdue for new finance software. "Cobbler's children syndrome," says Don Gootee, co-founder of the systems integrator. Core Technology Group Inc., which recently merged with Future-Next Consulting Inc., was set to implement Oracle Financials when Oracle Corp. announced an ASP program called Business Online. The big draw? "Didn't have to buy hardware, didn't need a full-time [database administrator], didn't need a full-time sysadmin," Gootee says. "We have plenty of people who can do that — but we want them out there billing hours, not stuck on the bench."

■ **Speed.** If a business decision demands a new application pronto, you can rent one pronto — no lengthy study, no turf wars, no wait for hardware.

■ **Bodies.** Pass hiring and head-count headaches on to your friendly ASP. "Companies don't have to put manpower in to maintain and implement these things," says Darwin P. Sing-

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ASP

son, a senior analyst at Aberdeen Group Inc. in Palo Alto, Calif.

■ **Price.** It's too early to tell whether using service providers is cheaper than doing it yourself. However, well-negotiated ASP pricing is predictable, which may make life easier.

The dominant pricing model for service providers is per user, per month. Analysts and vendors say that won't change in 2000, although other models, such as per server, are making headway.

CONCERNS ABOUT ASPS

■ **Security.** This is the No. 1 question on every IT manager's list. Vendors can quote you reassuring numbers all day long, but if you're not comfortable with your data living on somebody else's server, ASPs aren't for you.

■ **Bandwidth.** This is the No. 2 question. Users and analysts agree that if your systems are slow now, moving applications off-site won't help. But if your pipes are fat and your current access speeds are decent, service providers won't slow you down significantly.

■ **Customization.** Tom Kucharvy, an analyst at Summit Strategies Inc. in Boston, says, "There's a deep belief [in IT shops] that IT can develop apps better-suited to their organization, [while] the ASP model is based on limited customization."

Gootee says Oracle "wants to keep lots of people on the same release" but adds that "Oracle is robust enough so we don't need a lot of customization."

ASPs discourage customization because they want to keep their own costs down. Moreover, they're guaranteeing a certain agreed-upon quality of service, and that's easier for them to achieve when lots of customers are running the same applications.

■ **Implementation and integration.** "There's no magic dust associated with the outsourcing model," says Mike Ober, CEO of Brightstar Information Technology Group Inc., a consulting firm in Pleasanton, Calif. "When you use an ASP, there's still an implementation and there's still integration."

That's handy to remember, because some ASPs will try to sweet-talk you right past these unsightly details.

Craig Brown wrestled with the issue. "We wanted to do the install ourselves," says Brown, chief technology officer at Pointclick.com in American Fork, Utah, but "Oracle wouldn't let us. They're guaranteeing a [service-level agreement], so they insisted on installing it." The start-up, which pays Internet users in cash or in credits to surf the Web, rents Oracle Financials.

In the end, Brown was glad Oracle won the argument. "They did a stellar job," he says.

OUTLOOK FOR 2000

The ASP phenomenon will make significant headway in large companies this year. Service providers will find traction first in departments and remote offices, as did PCs and handhelds. Their value will become sufficiently clear to overcome concerns about security and customizability. But the fragmented market will become more chaotic before it consolidates.

Today, you have "ASP classic," as Kucharvy calls operations that simply host other vendors' applications. You have software vendors renting out their own applications and also hosting other vendors' tools. You have user companies turning into quasi-vendors — generating revenue by letting ASPs host applications developed for internal use. You have consulting companies reshaping themselves as ASPs. Look for the latter trend to intensify; the major consulting companies want a bigger slice of the pie, and they have an awful lot of expertise to leverage.

Fortunately, you ask the same questions no matter what type of ASP you're evaluating (see right). Applications themselves will be rearchitected to be more Web-centric. Increasingly, vendors with the Internet in mind are rewriting their client/server applications in the Internet programming language HTML. The advantages of this approach include a simple browser-based interface and data compression techniques that ease network loads.

FIRST STEPS

Assuming you've decided ASPs are worth exploring, here are a couple of suggestions:

> ## There's no magic dust associated with the outsourcing model.
>
> **MIKE OBER, CEO, BRIGHTSTAR INFORMATION TECHNOLOGY GROUP**

■ Take action before divisions or departments make a decision for you. IT should be the corporate leader in evaluating providers. If you act as the enabler rather than the defender of the status quo, you'll prevent future headaches. Without your guidance, remote offices and small divisions, for example, might sneak into rental agreements that don't meet your security or availability standards.

■ Decide what applications to farm out and what to keep in-house. The ASP movement is best known for its ability to bring meaty enterprise resource planning (ERP) suites to smaller companies. But if your corporation has a sizable investment in ERP, you'll probably want to retain ownership.

In general, ask what IT projects are part of your business's core competency. If it's strategic, a competitive differentiator or subject to ultrastrict confidentiality, as some health records are, you want control of it. Anything else is a candidate for outsourcing.

"Look for someone who's providing a specialized service that doesn't make sense for you to provide yourself," Kucharvy says. Infrastructure needs such as e-mail make a tempting target; several analysts and users expect e-mail rental to explode in 2000.

SELECTING AN ASP

Here are some factors to consider and questions to ask:

■ When you hire an ASP, you're hiring a consultant. Everybody interviewed for this story said a provider's knowledge of the applications it hosts is the most important factor by far.

That's one reason Brown went with Oracle. Brown had to marshal his IT forces carefully, keeping staff focused on a fast company launch. Oracle's expertise with its own Financials package was a major factor in his decision.

■ Depending on the level of customization you want, your ASP may need to know enough about your business

strategies and processes to help translate them into software modifications. Make sure any prospective ASP views your relationship as ongoing. "Every time your business changes, you've got to evolve your applications," says Ober. You must be able to "go to your ASP and start with your business requirements and strategies. Features and functions fall out of that."

Ober suggests scheduling regular meetings with a provider to keep it current on your business needs. If a prospective provider balks at such meetings, you might wonder whether it just wants to sign up your business and make sure the server's plugged in.

On the other hand, if your application is straightforward and you don't anticipate extensive customization, a plug-and-play ASP may suit you.

■ Pin vendors down on the basics. How many data centers do they have, and who's staffing the centers? "An ASP really needs guys in the back room making sure everything's working," Singson says. Do they deliver over a virtual private network? A wide-area network? Who are they allied with on the security and telecommunications fronts? Insist your provider have enough horsepower, bandwidth and know-how to accommodate not just your present needs, but also your growth.

■ Make sure you're happy with all service-level agreements.

■ Firm up the fee. ASPs sometimes make like used-car dealers when you ask how much their services will cost. It's not unheard of to see price quotes that vary by a factor of 10 for the same application from the same vendor. Figure out how many users will share the application. Then insist on a quote that includes all implementation and customization fees. Also, find out whether the vendor offers a rent-to-own deal. ▶

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BY JULIA KING

Answer CUSTOMER E-MAIL Fast!

FORGET ELECTRONIC wallet systems or live on-screen chat technology. E-mail should rank No. 1 on virtually every information technology leader's customer service improvement list this year.

To put it bluntly, e-mail-based customer service is dismal.

Fewer than 30% of companies surveyed last summer by The Yankee Group in Boston responded to queries within 24 hours. After 48 hours, only 60% responded. And even when companies did respond, getting an accurate answer was a 50-50 proposition.

At the same time, increasing numbers of customers are choosing to browse, buy and otherwise communicate with companies over the Internet.

At the end of 1998, 78 million Americans were online, according to International Data Corp. in Framingham, Mass. By 2003, that number is expected to balloon to 177 million.

The upshot: Companies risk losing Web-based customers in droves. With the competition a mere click away, experts say, customers simply won't wait two hours, much less two days, for answers to their questions.

The first step CIOs should take is to put themselves in their customers' shoes.

At Mortgage.com in Plantation, Fla., the acid test for e-mail responses — or any other customer service technology, for that matter — is this: Would this satisfy your own grandmother?

"It's a good test of someone you want to satisfy but who you already know is not the most technology-driven person," says CIO Andy Young.

To find out what customers want, Mortgage.com simply asks them, by using a mix of customer focus groups, online surveys and paper questionnaires.

"We don't wait for people to come to us. We go out and ask them," Young says. It's only after replies come back that the online lender begins thinking about technology.

That's how the company found out that customers expect to have the option of obtaining service by telephone, fax, in person or in a combination of these forms.

On the IT side, that means creating a single customer record accessible by customer service representatives handling telephone, fax and/or e-mail inquiries — something Mortgage.com is working on, Young says.

Other companies should be doing the same, says Jim Sterne, president of Target Marketing, a customer service consulting firm in Santa Barbara, Calif.

"A single customer record is the brass ring. It's the pot of gold at the end of the rainbow, but it's really hard to get to," Sterne says. "But if you can't have one giant, happy database, you need to build an infrastructure that allows customer service the visibility into the multiple databases you do have," he says.

With People in Place

Step 2 is putting in place the people as well as the technology to provide what your customers expect, advises Frank Petrilli, vice president of customer support at Datek Online, an online brokerage in Iselin, N.J.

Datek answers customer e-mail messages within two hours of their arrival.

In Yankee's survey of 41 companies, Datek also returned the most complete and accurate replies, which won the company a No. 1 ranking.

Well-trained people executing a formalized process — not technology — are the keys to the company's stellar e-mail track record, Petrilli says.

On the process side, Datek created standardized answers to customers' frequently asked questions, such as where to send a check. More complex questions are electronically routed to Datek's 30 full-time customer service representatives. These workers are grouped by their expertise in specific topics.

If an inquiry remains unanswered for longer than 24 hours, the system generates an electronic alert to a manager "who is required to go in and get to the bottom of why an e-mail isn't answered," Petrilli says. "We've created a process that doesn't allow an e-mail to linger."

Do It Yourself

Other steps CIOs can take are to personally monitor Web visitor behavior — and then to experience it themselves. "See what happens when you try to do business at your own company's Web site," advises Peter G. W. Keen, a *Computerworld* columnist and an IT consultant in Great Falls, Va.
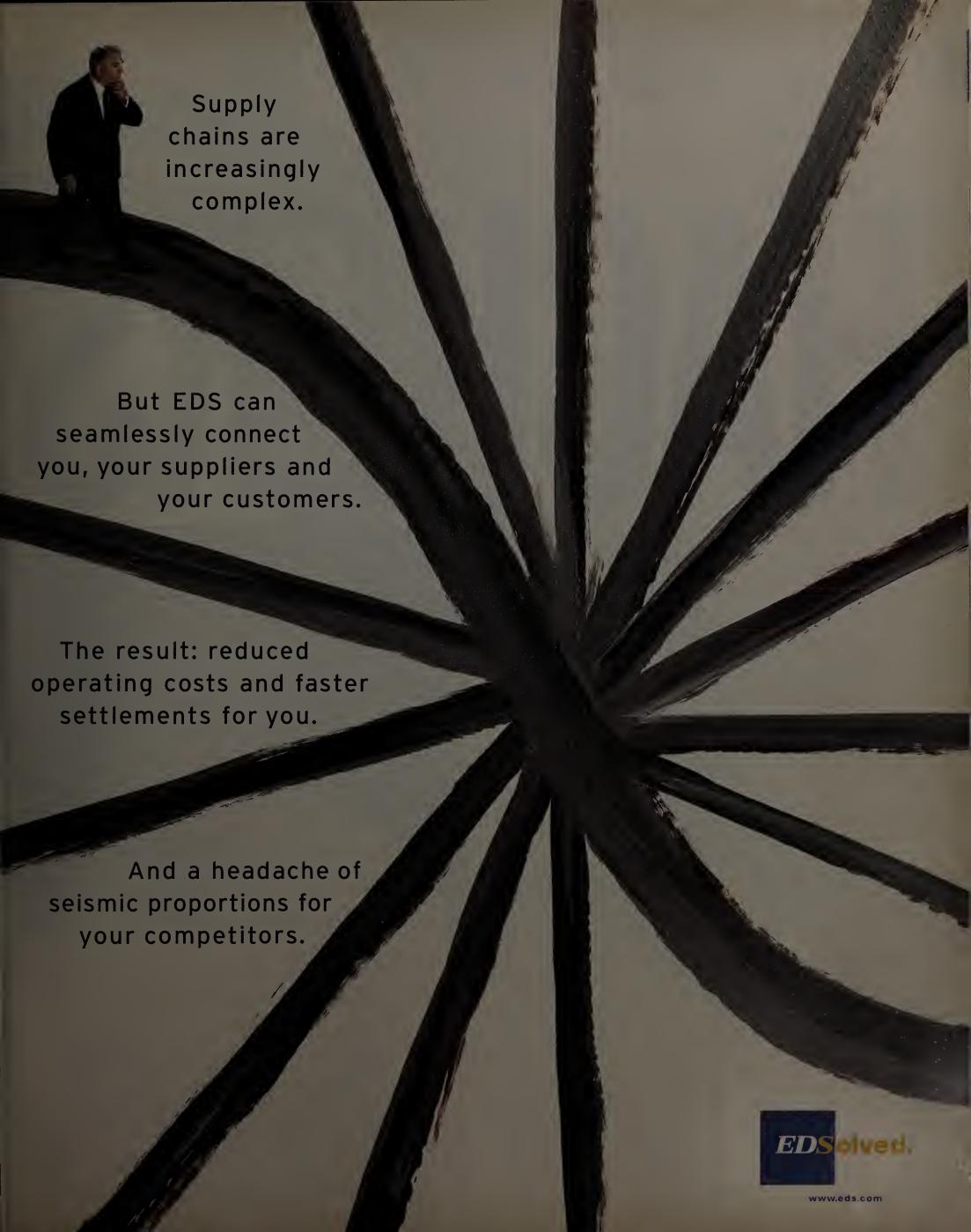
"The CIO has got to take a really close look at what happens to customers at their Web sites, because the real issue is e-commerce follow-up," Keen says.

CIOs also need to put a far greater emphasis on training their staffs to be customer service-oriented, according to John Tschol, president of the Service Quality Institute in Minneapolis.

"Technology fails consistently, which is why you have to have a backup staff that can respond to problems people have," Tschol says. "You've got to teach people the interpersonal skills that good customer service requires."

But expect a fight at the budget table. "A company will drop $100,000 in seconds to buy new equipment, but they're reluctant to spend even $1,000 to train and develop a staff that is customer service-driven," Tschol says. ▶

FRANK PETRILLI OF DATEK ONLINE: "We've created a process that doesn't allow an e-mail to linger"

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Keep
HACKERS

Out of Your Web Site

BY DEBORAH RADCLIFF

HAL POMERANZ sees it all the time: A corporate Web site gets hacked and the business manager calls him to fix it. "The dot-com companies are so busy building a Web infrastructure that security is just an afterthought," says the San Francisco-based information security consultant, who specializes in Internet start-ups. "Often, we're just the clean-up guys."

Pomeranz and many other security consultants say Web security would be a lot less problematic if security measures were built in to the infrastructure to begin with.

More than 300 hacked Web pages are archived at AntiOnline (*www. antionline.com*), an information security services and "ethical hacking" group. And these just cover the first half of last year.

Your goal is to avoid having your Web site show up in this hall of shame. Otherwise, your dot-com business could lose face, transactions or consumer confidence.
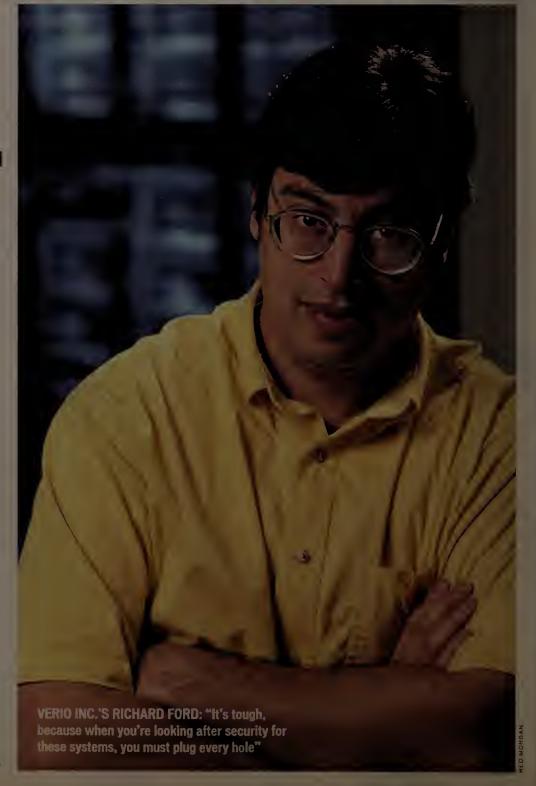
Jeff Hormann, special agent in charge at the U.S. Army Criminal Investigations computer crime agency in Fort Belvoir, Va., knows the cost of Web site breaches. His department investigated an Army Web site hack last June, after a hacker group called Global Hell exploited a well-known

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[CRITICAL SUCCESS FACTORS]

- ☐ Follow general security procedures of securing the host operating system.
- ☐ Secure the network access to the Web server.
- ☐ Properly configure any Web applications running on the Web server.

VERIO INC.'S RICHARD FORD: "It's tough, because when you're looking after security for these systems, you must plug every hole"

HACKERS

weakness in the Army's Web server software and plastered it with red graffiti that read, "Global Hell won't die."

The incident cost the Army dearly in terms of negative publicity and investigative work.

"The cost of these things can be astronomical, depending on the severity of the intrusion," Hormann says. "It's not uncommon for a Web page alteration to run tens of thousands of dollars to repair."

Security Layers

There are many layers and flavors of Web site security, all of which depend on the function of your Web site. And for each layer, you're talking more money. So, the first step in protecting your Web site is to determine the value of the data that needs protecting — a calculation best made by the business managers, not the IT department.

"A lot of times, the technologist will go to the budget people and say we need $50,000 to secure the Web site. But they think you're just wanting a new $50,000 toy," says Ian Poynter, founding president of Jerboa Inc., a computer security consulting firm in Cambridge, Mass.

"If you truly want to look at the value of your information, you need to involve the businesspeople, because they know how much the information is worth," Poynter says. "Then the technologist can say, 'I need $50,000 to secure $3 million worth of data.'"

Part of this calculation is based on the Web site's purpose.

At the very bottom level are Web servers that house public content, much like the Army's server. These servers should run outside the corporate firewall so they act as a stand-alone box.

With no connection to the network, the threat to the rest of the network is contained and the cost of a breach is limited to public embarrassment and downtime.

If the Web server is damaged, you're also looking at the cost of replacement and data rebuilding. For this reason, information security experts strongly recommend keeping backup CDs of the server contents to bring the site back online at minimal cost.

A dual-purpose Web server with public and some sensitive content calls for a proportionately higher investment.

"I have an area on my Web site for customers to go in and pick up job proposals and other low-classified data.

For this, encrypted user names and passwords are just enough protection," Poynter explains.

Once you start involving customers interactively, data value and protection costs rise sharply. So transactional systems such as online shopping and banking sites will require the highest investment.

"Getting your Web site defaced is just a small part of the Web security package. What's really important are confidentiality, availability and integrity. It's tough, because when you're looking after security for these systems, you must plug every hole," says Richard Ford, director of technology at Englewood, Colo.-based Verio Inc., a business Web site hosting and connectivity service provider that's home to more than 6,000 e-commerce sites, half of which are transactional.

Sites like these can't afford downtime. Nor can they afford breaches in their servers that allow access to consumer data and credit-card information. Not only should this Web site security policy focus on encrypting transactions, but data on the server must also be encrypted. And such companies must practice due diligence.

Take banking, for example. Currently, there are 3,000 bank and thrift Web sites on the Internet, 855 of

which are transactional, according to the Federal Deposit Insurance Corp. (FDIC) in Washington.

"If banks are going to offer an Internet banking product, they have to think about data encryption, penetration testing and internal audits that examine procedures, policies, access controls and how the site is run," says Jeff Kopchik, a senior policy analyst at the FDIC. "Banks need to sit down and plan for this during development. They need to budget for continued expenses. They'll need money to upgrade, review and resecure sites on an ongoing basis."

Weak Spots

It's a tough task, made more complex by the very nature of the systems you're trying to secure. Attackers can violate a Web site in thousands of ways.

Crackers start by looking for common Web server flaws that often go unpatched, according to John Green, program manager for the Shadow Intrusion Detection Team at the Naval Surface Warfare Center in Vahlgren, Va.

Common problems on Web servers include overly permissive common gateway interface (CGI) bins — a directory that administrators put executables in to help run the Web site — that hackers can exploit to gain root control of the server. There are also holes in application server gateways that can be exploited, along with hundreds of other vulnerabilities that, if unpatched, can lead to full control of the Web server.

For best security, strip the Web server down to only those services actually needed to run the server and delete unnecessary CGI scripts, says "Weld," a nonmalicious hacker and a member of the hacker/consulting firm the l0pht in Boston. "If the code isn't running, an attacker can't exploit it," he adds.

If crackers can't get in by exploiting a Web server, they'll attack the operating system itself. The leading operating systems (Windows NT, Unix, Solaris, Linux) are also riddled with security holes, often overlooked by administrators.

A favorite attack on the operating system is a buffer overflow — flooding a buffer with too many data streams and dazing it into allowing attackers in at root level. Another common attack method is "session hijacking," in which the hacker spoofs his IP address to take over the identity of a trusted machine. Crackers are also fond of corrupting the domain name server to assume the identity of a connected IP address.

According to "Mudge," another consultant with the l0pht, who won't use his real name, the best protection for operating system vulnerabilities is to tighten permissions and put the Web

> ## "
> # Know what you're doing and secure against people ripping you off.
>
> **DAVID STROM,**
> **INTERNET CONSULTANT**

server behind a filtering device that would only allow Internet connections onto HTTP Port 80. Remote administration and connections should pass over a different network connection that isn't reachable from the Internet.

Even online shopping cart applications can be exploited. Shopping applications are often poorly coded, says Mudge. They can be manipulated to accept file uploads or be used to modify or execute commands on the system.

David Strom, an Internet and networking consultant in Port Washington, N.Y., published a new way to hack shopping cart applications in an Oct. II newsletter. He showed how to dupe the shopping cart application into selling a product for $0.

"The message here is, if you're going to put up a Web storefront, be careful," Strom says. "Know what you're doing and secure properly against people ripping you off in a number of ways. You have to know all possible entry points."
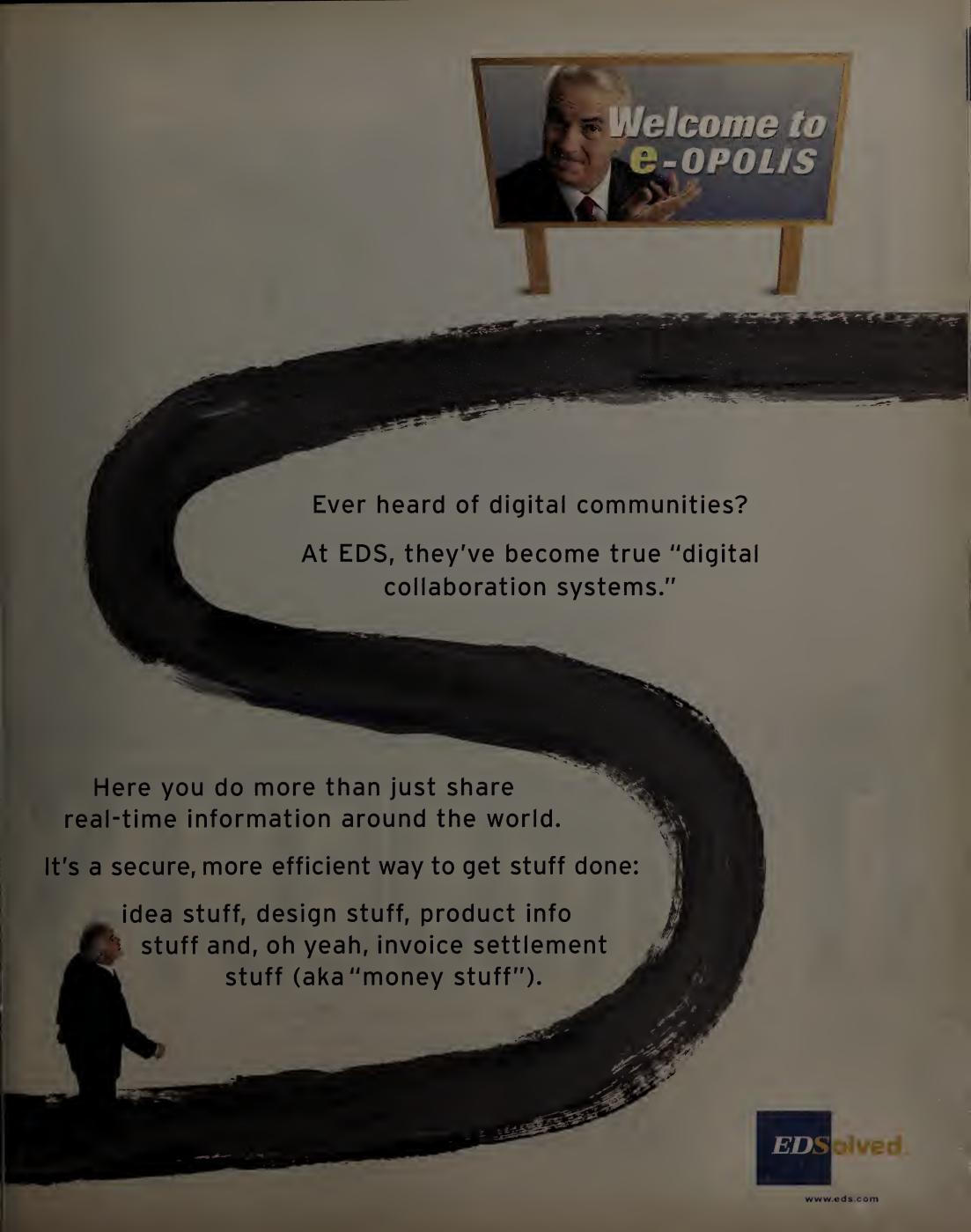
Thus, if security is important to you, then audit the source code of your shopping cart and Web applications running to make sure they're properly sanitized and don't have buffer overflows, Mudge adds.

But even with the best protection policies in place, bulletproof security is never attainable because of factors such as human error, new vulnerabilities and the public nature of Web sites.

"If you're making a Web page, you're inviting people in. That's what Web pages are for," the Army's Hormann explains. "Hackers are also invited guests. They just take more liberties than they should. That's why webmasters need to be smart in the way they set up their Web pages."

When looking at Web site security, you have to ask: What would it cost your company if you don't get tough on security? ▶

Radcliff is a freelance writer in Northern California.

BEST PRACTICES

1. **Implement a perimeter security** solution by putting a firewall between your Web server and the rest of the network. If possible, block Internet traffic into the network.

2. **Disable all unused services,** close unused ports and assess protocols. Default services (especially FTP and Telnet) leave you vulnerable.

3. **Log and review** denied traffic for suspicious activity.

4. **Keep up-to-date** on patches for all software on the server.

5. **Secure remote connections,** either via token-based identification, virtual private network encryption or Secure Shell encryption.

6. **Set decoy traps.** Often referred to as "honey pots," these are fake networks to capture attackers and log their activities.

7. **Regularly review** log files.

8. **Audit and review** Web scripts for security vulnerabilities. Or set up monitoring devices in the demilitarized zone like the freeware TripWire or sniffers.

9. **Stay abreast** of vulnerabilities, bugs and patches by monitoring your software vendors' Web pages and security newsgroups.

10. **Layer multiple tiers** of security in accordance with the value of the server contents. *– Deborah Radcliff*

SOURCE: MICHAEL LYLE, CTO AT RECOURSE TECHNOLOGIES INC., PALO ALTO, CALIF.

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CRITICAL SUCCESS FACTORS

☐ Act first on projects that contribute most to the bottom line.
☐ Determine anticipated return on investment.
☐ Balance resource demands across multiple business units.

COLONIAL PROPERTIES' JACK KEMPH: "You take care of those projects first that collect money and pay the bills"

ANN STATES

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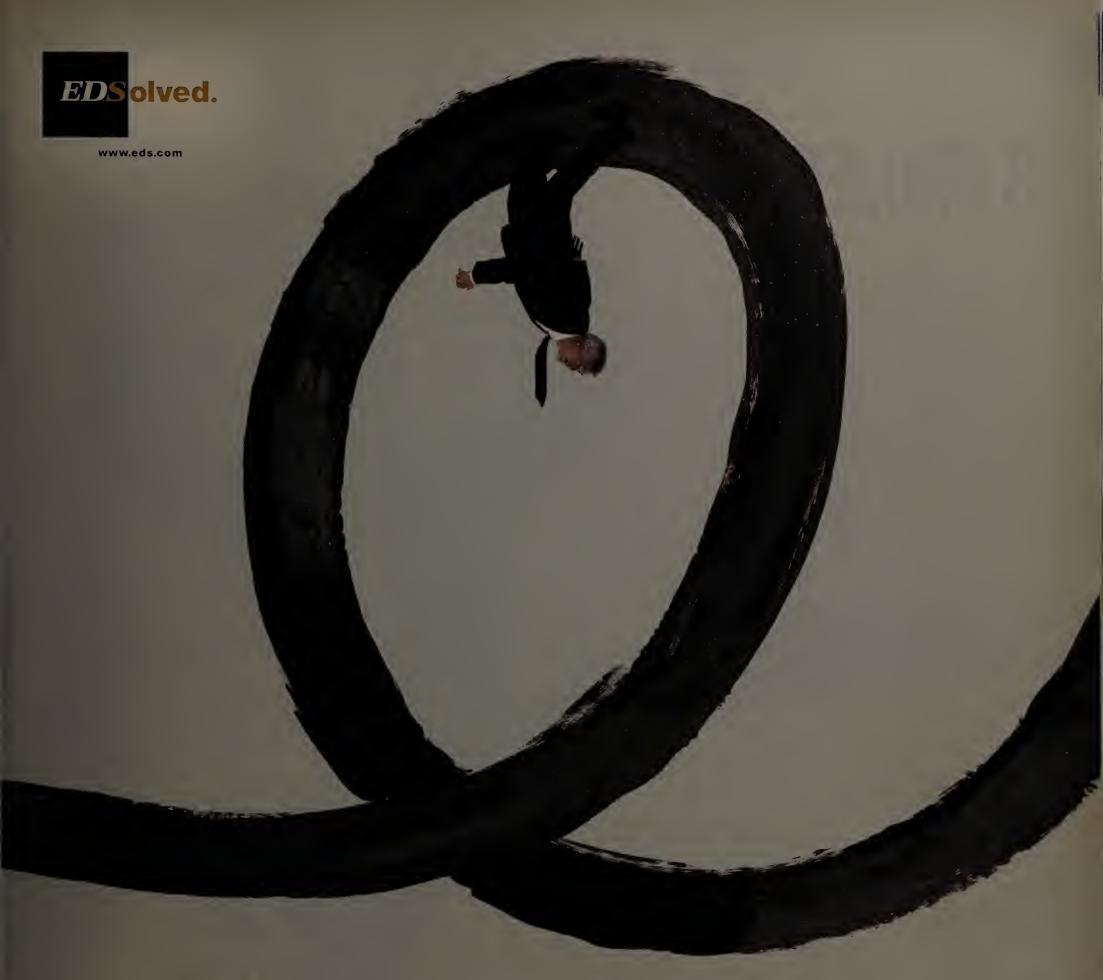
Stalled By Y2K

BY THOMAS HOFFMAN

AFTER THROWING their collective resources into do-or-die year 2000 efforts last year, many CIOs are dusting off IT projects that were shelved by the millennium bug and powering them back up.

A hefty project backlog at many Fortune 1,000 companies is forcing CIOs to juggle demands from competing business units for information technology resources. "There's a sig-

nificant pent-up demand" for e-commerce and enterprise resource planning enhancement projects because of resource constraints and so-called Y2K lockdowns, says Michael Poehner, president and CEO of DMR Consulting Group Inc. in Edison, N.J.

But trying to prioritize which projects to tackle first is a challenge in itself. The key is to set priorities based on the ones that will deliver the biggest bang for the buck. And yet the next wave of IT applications

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IT PROJECTS

— e-commerce, supply-chain management and customer relationship management — are so new that "the value equation hasn't been tested all that well," Poehner says.

Nevertheless, bottom-line benefits remain the best metric for setting priorities. Regardless of what business your company is in, "you take care of those projects first that collect money and pay the bills," says Jack Kemph, director of IT at Colonial Properties Trust Inc. in Birmingham, Ala.

Balancing the Load

Various departments and business units will be clamoring to get their projects at the top of the list. To strike a balance among the competing demands, a company's top brass should first "decide what kind of company you want to be five years from now," says Cheryl Smith, CIO at KeySpan Energy, a Brooklyn, N.Y.-based gas and electric utility.

Once top management has agreed on its vision for the future, she says, the project prioritization "falls right in there."

KeySpan, for example, plans to channel its fiscal 2000 IT investments in three key areas: completing its systems integration efforts with Long Island Lighting Co., using technology to improve customer service in the wake of industry deregulation and rolling out technologies to help residential and commercial customers better track their energy usage and costs.

For many other companies, e-commerce is high on the agenda. At Merrill Lynch & Co., for example, three of the brokerage's top four projects planned for this year are e-commerce-related.

The project that carries the most weight is the launch of an online brokerage for Merrill Lynch's North American customers, called ML Direct, which was introduced in December and will be extended to Europe and Asia early this year, says John McKinley, chief technology officer at the New York-based financial services firm.

To meet its customers' needs, the company decided in late 1998 that it would speed up its year 2000 efforts and complete the work by July 1999 so it could spend the second half of 1999 turning its attention to its online initiatives "and get a jump-start on our competition," McKinley says.

By accelerating its year 2000 project, "we got much more focused participation from [the business units] on Y2K because we were able to engage them in earnest for a shorter period of time," he says.

Another company that plans to leverage the Web and related technologies to help it run its business more efficiently is Turtle Wax Inc. Once the Chicago-based car care products maker lifts the hood on its Y2K lockdown later this month, the top project to buff up will be an intranet-based system for developing new products.

It will let marketing and engineering professionals develop product prototypes faster than they can today, "regardless of where they may be located," says Dennis Lynch, IT director at Turtle Wax.

Historically, consumer product development has been a step-by-step process in which each portion has to be signed off before the next step can begin. Turtle Wax wants to connect its marketing and engineering folks online so they can use a library of electronic prototypes to design a bottle for, say, a new car wax, while a label for that product is already under development, according to Lynch.

"This kind of approach may not be new for someone like Boeing, but it is new for a consumer products company and especially for a midsize company" like the privately held Turtle Wax, Lynch says.

Back in the Game

For some companies, the New Year also brings a chance to kick-start some IT projects that had to be halted because of Y2K. Last February, Colonial Properties began installing a new financial analysis system from Hyperion Solutions Inc. that helps the company's property managers analyze their commercial leases and rates, says Kemph, whose company owns and manages office complexes and shopping malls across nine Sunbelt states.

Kemph and his team had to withdraw from the Hyperion project after a few months to deal with Y2K-related issues. Still, the early work on the project helped Colonial Properties realize that its IBM AS/400 environment wasn't going to have enough horsepower to run the financial analysis system.

Using a set of simple financial reports Colonial Properties had writ-

ten, a single RISC-processor AS/400 machine with 768M bytes of RAM took nearly 10 hours to "do an initial pass on the code" without completing the analysis, says Kemph. His group then ran the same reports against a 32-bit Intel Pentium III-based machine, which delivered the results in just 17 minutes.

That helped Kemph's team convince the firm's board it would need to replace the AS/400 environment with a Microsoft Windows NT platform, a task it recently completed.

Project Priorities

In many companies, executive steering committees have the job of prioritizing key IT/business projects. But that doesn't stop influential business unit managers from pressuring CIOs to adopt their pet projects.

At KeySpan Energy, the pent-up demand for systems enhancements and new development initiatives "is enormous," says Smith. The executives who run the company's business units presented their IT wish lists to senior management in November and had to defend the business rationale for them.

Of course, IT projects don't have to be done in a serial path, one right after the other. Like other companies, American Re-Insurance Corp. "will work on multiple [projects] along parallel paths," says Douglas Paige, vice president of the IT division at the

Princeton, N.J.-based firm. And as at other companies, "there's more [IT work] being requested than we'll be able to do [this year], but that's the case every year," Paige adds.

To strike a balance, Paige says his group will work with company business units and the technology steering committee to determine which projects offer the highest financial or productivity returns.

But where will the money come from to pay for these technology projects? According to IT executives at Merrill Lynch and KeySpan, that won't be a big problem because in most cases, the investments are being made by the business units that really crave them.

At Purchase, N.Y.-based MasterCard International Inc., funding for key IT projects this year — namely continued enhancements to the company's transaction processing systems — has been unaffected by the year 2000 effort.
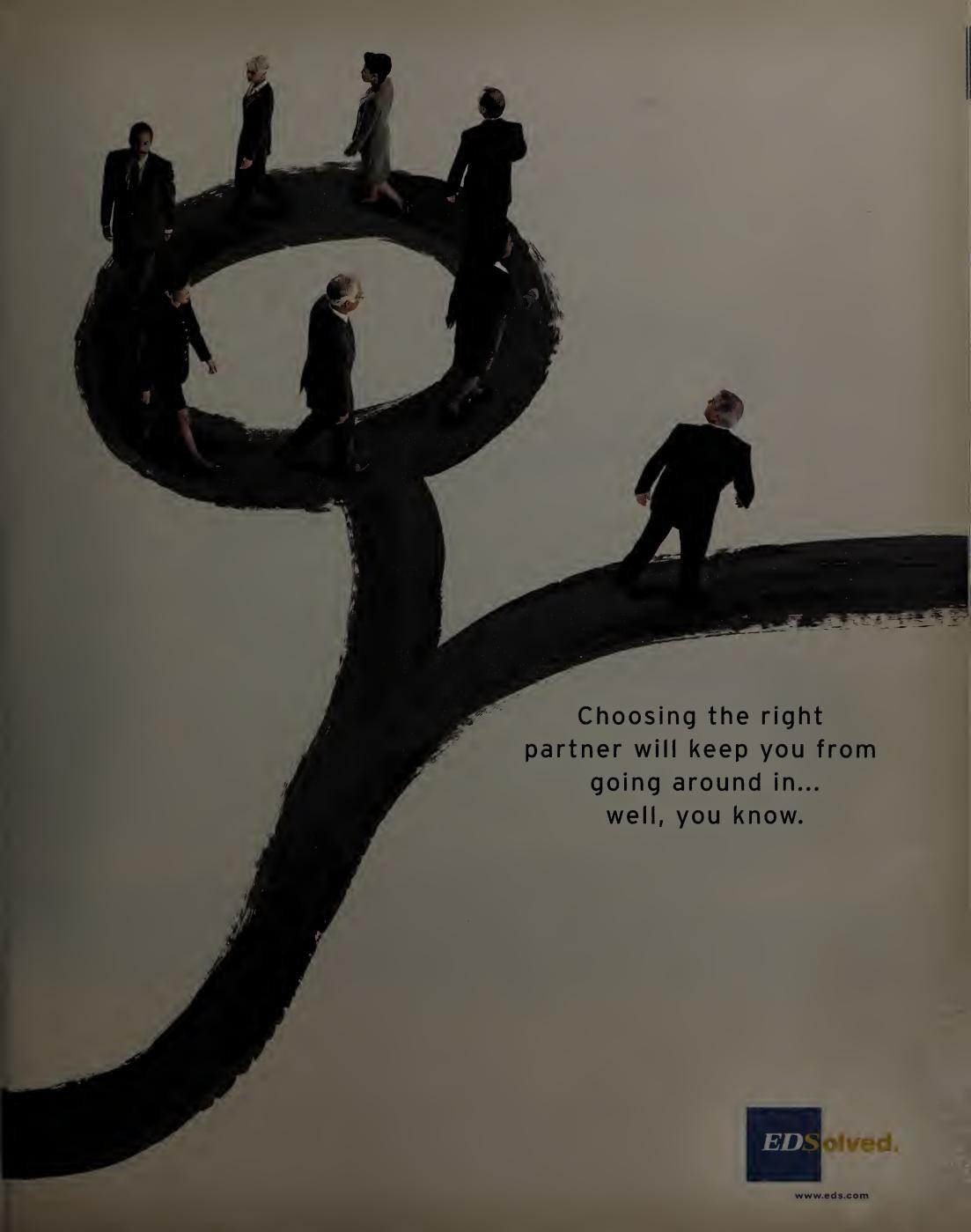
That's because the association of credit-card issuers separated its Y2K project from its base application development budget, according to Rob Reeg, senior vice president for systems development at MasterCard in St. Louis.

The apparently ample funding means that IT executives such as Reeg may find that time will be an even more precious commodity than money when it comes to clearing out the huge, post-Y2K backlog of technology projects. ◗

"

There's more [IT work] being requested than we'll be able to do [this year], but that's the case every year.

DOUGLAS PAIGE, VICE PRESIDENT OF IT,
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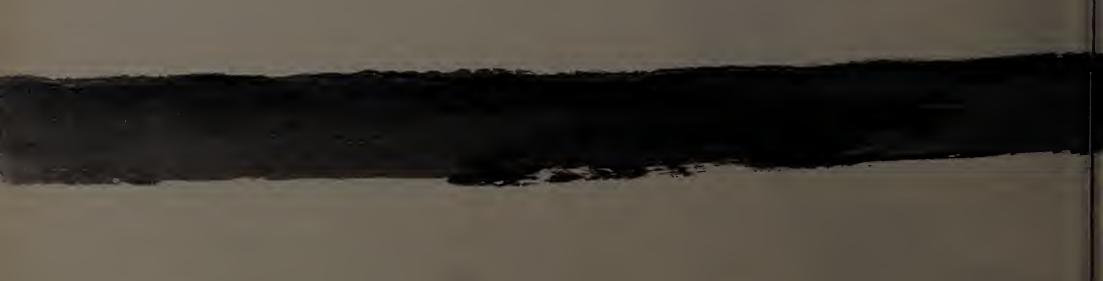
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Make PRIVACY

An IT Priority

CITIGROUP'S Joan Warrington says companies need to live up to their posted privacy policies – or pay the price

NICK CARDILLICCHIO

BY SHARON WATSON

AS YOU CLOSE OUT your year 2000 repair projects and watch for lawsuits, be forewarned: Privacy issues surrounding the collection and use of consumer data will be the next big area for litigation and legislation.

"If yours is an organization with lots of databases, privacy could be the next Y2K," says Mary J. Culnan, a privacy expert at Georgetown University in Washington.

With consumers nervous about privacy invasions and the Federal Trade Commission watching to see how well businesses will police privacy, creating privacy policies — and then ensuring all information systems conform to and support those policies — will be a critical business and information technology task for 2000.

Companies are already being sued for not living up to their posted privacy policies, says Joan Warrington, regulatory and legislative counsel for Citigroup Inc.'s global consumer businesses. "This is a real liability for companies now," she says.

With high legal and business stakes, privacy officers and consultants all say privacy can't be left to the IT department alone. Instead, privacy must be a corporatewide initiative, launched and supported from the executive suites, with input and enforcement from all areas of the business. Citigroup has more than 50 privacy officers worldwide, plus internal auditors and a privacy committee.

Privacy generally begins with a policy that follows "fair information practices" by telling consumers what information the company collects, how it will be used and whether it might be shared and with whom, say consultants. Policies also should give consumers the ability to "opt out" or deny use of their personally identifiable data and give them the right to review and correct their data.

IT support for such policies can be tough. If a consumer opts out of sharing data, then none of the information about that consumer can be sold or shared — and that data may be in several databases. All applications would need to be updated to reflect that consumer's preference.

Next, many experts expect "opt in" or consent clauses, in which consumers give their express consent to how their data may be used, to become standard practice. If so, every application using personally identifiable data would need to be revamped to accept such clauses. Experts say upgrading legacy systems with new privacy-related fields can be onerous, and they recommend that all new applications be built with privacy issues in mind.

Then there's the issue of what constitutes "personally identifiable data." For instance, some privacy advocates say a name, address and telephone number are personally identifiable data. Yet that data is available in many public directories and records. "An organization must look at each piece of information and decide what is confidential and what isn't and protect it accordingly," says Sean Millen, an information security officer at Citigroup.

So, where does the CIO start? First, get in your company's privacy loop, if one exists, or urge your CEO to get serious about creating a companywide privacy policy that encompasses all processes and procedures, not just Web-related transactions. Point out that the public, legislators and regulators are focused on privacy. Child-oriented Web sites and the health care industry already are subject to federal privacy rules.

"If businesses don't raise the bar on policing themselves regarding privacy, then government is going to lower the boom," says John Ford, vice president for privacy and external affairs at Equifax Inc. in Atlanta.

Audit your systems. Find out who collects consumer data and for what purpose. Are there sufficient security measures to protect that data?

Don't forget to require third-party contractors to meet your privacy policy requirements. Also add privacy parameters to your IT project approval process, Citigroup experts advise.

Consider getting a privacy seal of approval for your Web operations. These seals, available from organizations such as the Better Business Bureau Online and Truste, tell Web visitors that the site and its underlying systems and policies have been audited by a third party for privacy protection.

"In the future, there will be sites with seals from reputable groups — and those without them will be *terra incognita*," says Alan F. Westin, publisher of the newsletter "Privacy & American Business."

However, Citigroup has forgone seals in favor of its own internal auditors, who report directly to the company's board of directors. Besides, most seals aren't meaningful for international privacy standards, such as the European Union's strict privacy rules, says Steve Durkee, a privacy implementation officer at Citigroup.
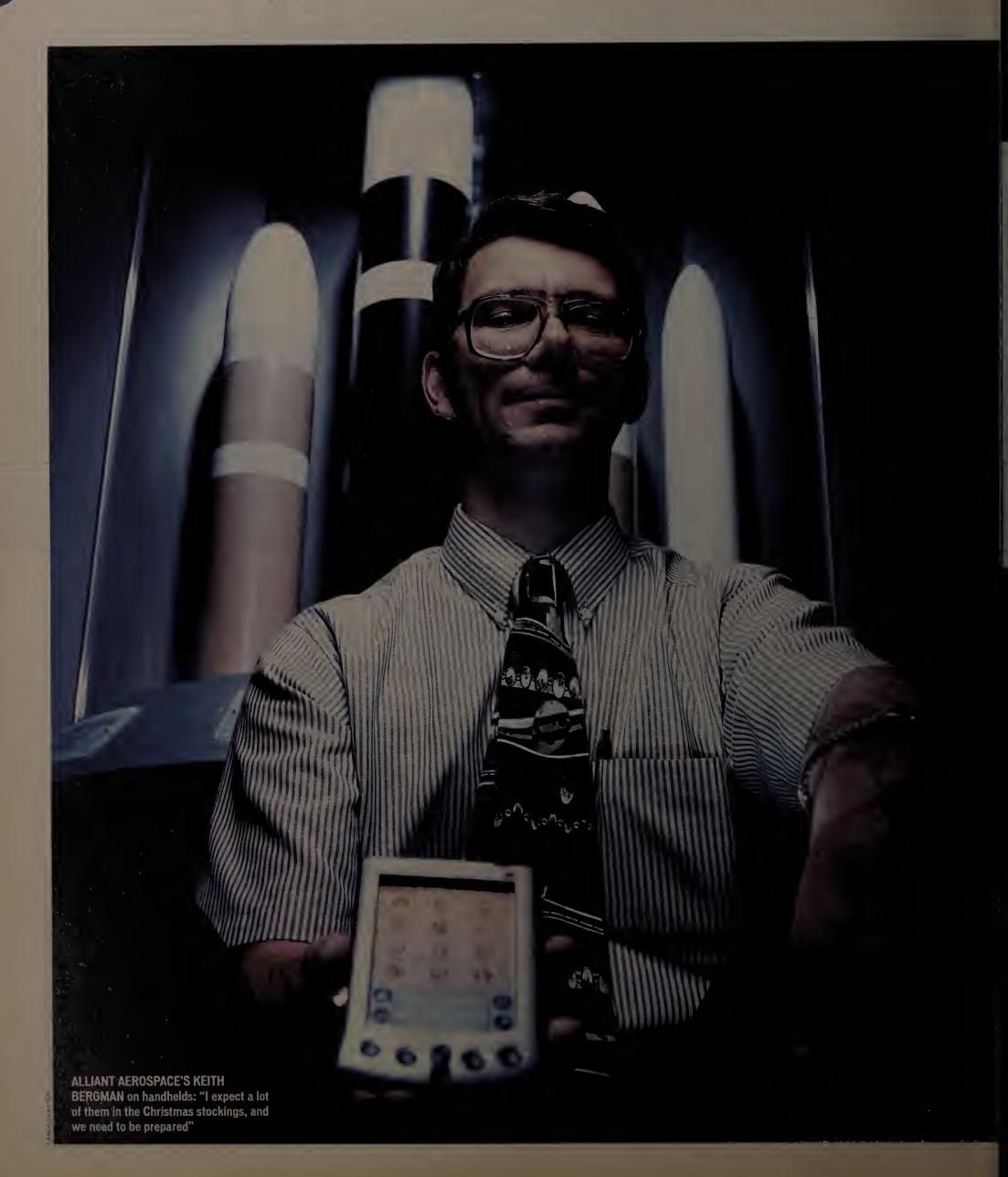
Whatever you do about privacy, do it now. "Don't let privacy become a crisis and consume huge amounts of IT budget," Culnan says. "Don't miss your chance to influence your company's privacy policy and technology." ▶

Watson is a freelance writer in Chicago.

CRITICAL SUCCESS FACTORS

- ☐ Be vocal and active on the team that drafts your company's privacy policy.
- ☐ Audit all data systems: What data is collected and for what purpose? How is it protected?
- ☐ Build privacy practices, such as access rules, into IT policies, procedures and systems.

ALLIANT AEROSPACE'S KEITH
BERGMAN on handhelds: "I expect a lot
of them in the Christmas stockings, and
we need to be prepared"

BY MATT HAMBLEN

WITH THE END of the gift-giving season, Keith Bergman expects workers at Alliant Aerospace Co. to bring more flashy handheld computers to work.

And that means end users will be struggling to set up desktop synchronization and calling impatiently for help desk support.

But what delights end users will hardly be welcome to everybody.

"I expect a lot of them in the Christmas stockings, and we need to

Prepare For the Flood of

be prepared," says Bergman, an information technology manager at the Magna, Utah, manufacturer of rocket motors.

Bergman is a fairly typical IT manager witnessing the start of a new era of handheld computing. Industry analysts say the backdoor entry of handhelds at corporations rivals the client/server revolution that overcame mainframe computing in the 1980s.

"This is client/server all over again, and if you recall the early days of client/server, the departments bought their PCs and told IT, 'Screw you, we need to get our work done.' And this is what's happening with handhelds," says Jack Gold, an analyst at Meta Group Inc. in Westboro, Mass.

Plan Ahead

Rather than sitting still while the number of handheld and smart-phone users — and their demands — grow, analysts urge companies to begin the long-term planning critical to keeping handheld administration costs down, preventing support chaos and minimizing security risks.

In general, analysts agree that companies should standardize on several models of handhelds and smart

phones, buy the machines with company funds and set up synchronization on corporate servers. All of that requires plenty of forethought and preparation for the help desk.

Picking a Standard

Alliant will probably make the Palm OS from Palm Computing Inc. in Santa Clara, Calif., its handheld standard, partly because three top-level executives walked in the door with PalmPilots a year ago, Bergman says. Although IT had no say in choosing the first interlopers, he says, Palm is luckily an easy platform to support.

Although analysts urge IT shops to establish handheld standards, that doesn't mean picking only one machine. It could be a matter of picking several devices.

"Better three than 20 or 30 brought in by everybody," says Gold.

IT departments might want to do as Sprint Corp. in Kansas City, Mo., did last spring. Sprint standardized on one Windows CE product and one Palm product, then offered to pay for the devices and prepared the help desk to give assistance on those machines alone.

"The biggest mistake you can make is to tell users, 'You can't have any of

HANDHELD DEVICES

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HANDHELD DEVICES

these handhelds,' " advises Ken Dulaney, an analyst at Gartner Group Inc. in Stamford, Conn.

In setting standards early on, IT managers can prevent squabbling among departments over the type of device. "Most users really want some guidance from the professional IT department," Dulaney says.

He recommends that IT managers pick one vendor and model for each of the following operating systems: Palm OS, Windows CE and EPOC, a smart-phone and handheld platform from Symbian Ltd. in London.

"Then, if somebody has a really good business case for using something else, you break the rule," Dulaney says.

A key to stopping the arrival of unwelcome devices is to tell users the help desk won't provide synchronization support for anything but the company-standard machines.

Pay for the Machines

Analysts urge companies to pay for the machines — for greater control and security — even though it might be enticing for companies to have end users bear the cost. But so far, few companies are buying handhelds in bulk at discount, except for vertical applications such as support for shipping or manufacturing functions.

The annual cost of owning and supporting each handheld will be about $2,700, including the average handheld unit's price tag of about $450, according to Gartner. End-user chores and downtime account for 40% of that cost — and the percentage will be even higher if IT isn't prepared to help users with synchronization needs.

"We wouldn't even consider having handhelds if the TCO [total cost of ownership] were that high," says Greg Parquette, director of desktop configuration management at Fidelity Institutional Retirement Services Co. in Marlboro, Mass.

The annual handheld TCO should be only about double the purchase price, says Parquette, explaining that his experience is that end users can easily set up and support their own Palm device synchronization with their own PCs.

About 5% of the 2,700 end users at Parquette's operation have handhelds,

some purchased by Fidelity.

Analysts recommend companies buy handhelds so they can retain some control over deployments and the security of the company data held inside the devices.

For example, if a salesman walks off the job with a valuable contact list of recent sales leads, it might be hard to ask him to surrender his handheld if it was a gift from his wife, analysts say.

Big Things in Small Packages

"While you may think your mainframe has your most mission-critical data, I'd argue that the most recent — and therefore more critical — data is right there on the small device," Dulaney says.

Many IT managers are just beginning to understand the security dimension of small devices. While users have always been able to steal corporate assets on a diskette or a laptop, smaller devices arguably make it quicker to download data and then hide it, analysts say. And because companies don't have standards in place and don't know what devices are being used, they're less able to react if problems occur.

If synchronization of handhelds to corporate data is managed at the server level, IT managers can — in theory, at least — control what data is downloaded, add a security layer and provide

for administrative tasks, including software updates.

Several vendors are providing server synchronization products, but analysts say they are immature and likely to change substantially in the next two years. Leading handheld server synchronization vendors include IBM, Mobile Automation Inc., Oracle Corp., Puma Technology Inc., Riverbed Technologies Inc., Sybase Corp. and Synchrologic Corp.

IT managers should support synchronization in all pathways of data movement, from server to smart phone or handheld; between the handheld and the PC; and between the PC and the server.

The software should also support direct, dial-up and wireless connections and multiple data types. Gartner recommends also using synchronization software to track transactions both between the user's handheld and his PC and the server.

Beyond Toys

Some users say management and synchronization policies are hard to implement because they don't always get the attention of top executives.

For example, managers at Minnesota Mutual Life Insurance Co. in St. Paul, Minn., recently bought 150 PalmPilots for a controlled rollout but "had to back off from all the support and administration issues we

might have wanted because upper management only viewed the handhelds as toys and we had weightier systems matters to address," says Steven Engel, manager of network engineering.

Analysts recommend that IT managers point out the TCO and security risks to upper management to overcome such attitudes.

The U.S. Postal Service recently began a pilot project allowing tracking of mail bags via handhelds that use bar-code readers. As the project goes live with up to 1,500 users this year, the Postal Service will employ Vienna, Va.-based Riverbed's ScoutIT synchronization software at the server, which supports access to data by up to 2,000 users at once on both Windows CE and Palm platforms.

"It allows us to maximize the synchronization so we don't waste a lot of time with people waiting to get to data," says Clayton Bonnell, manager of internal operations at the Postal Service in Washington.

Getting Ready

Even though many analysts regard handheld adoption as inevitable, the transition still requires some high-level discussions about the business purpose, says analyst Phillip Redman at The Yankee Group in Boston. "There needs to be a corporate understanding of whether handhelds can be a benefit and not just a hassle that costs money," Redman says.

Once the business direction is set, new duties for the help desk should be endorsed from above — so help desk workers see the need and purpose of addressing machines they widely view as gadgets.

Setting standards on a few machines is the best way to prepare the help desk because technicians need to be trained only on those few. And with fewer devices to support, help desk personnel can ensure they have tabs on security software that protects handhelds from hackers and viruses, Redman says.

"There's not a lot of help desk training required, but if you get synchronization at the server, you save headaches," Gold adds.

Once IT has put in place a working plan for supporting handhelds, the challenge two years from now will be which department supports smart phones.

According to analysts, voice devices need to be managed by IT because they will have computing power and access to corporate data. But making that organizational shift could be a long and involved turf battle because cellular phones are often controlled by the telecommunications department or individual business departments. ▶

> **While you may think your mainframe has your most mission-critical data, I'd argue that the most recent data is right there on the small device.**
>
> **KEN DULANEY, ANALYST,
> GARTNER GROUP**

BY JAIKUMAR VIJAYAN

OFFICE SUPPLIES vendor Corporate Express Inc. in Broomfield, Colo., is saving $10,000 per day in equipment, maintenance, licensing and personnel costs after the company reduced its collection of 48 Unix servers to two.

Similar techniques should help trim a tidy $750,000 in annual costs when Toronto-based The Canada Life Assurance Co. finishes eliminating 70 servers from its collection of 162 midrange systems.

Both are examples of companies that are turning to server consolidation to combat the complexity and costs associated with server sprawl — a common result of business growth, decentralized operations, mergers and acquisitions.

Server consolidation can be done many ways, but it typically means relocating existing servers to fewer sites or replacing numerous smaller servers with a few larger systems — or both. But getting there involves many management and technology challenges. Key among them are the following:

■ Maintaining pre-existing service levels so that business units don't suffer any performance degradation during the process and don't notice what's been done behind the scenes afterward. This usually means having to phase in the consolidation, rather than attempting a big-bang approach.

■ Choosing the right workload mix to run on a consolidation server. For instance, combining multiple data warehouse applications under a single copy of an operating system is sure to trigger performance-degrading fights among them for system resources.

■ Using the right tools to monitor, manage and tune the performance and availability of the consolidated servers. Tools to do this are still scarce, especially in the Unix and Windows NT arenas, but there are products from companies such as Austin-based Tivoli Systems Inc. and Houston-based BMC Software Inc. that provide management capabilities.

■ Doing an asset check. Find out exactly what you have, where it all is and how much you have. Not all applications can be consolidated well. Some applications were designed to run optimally in homogeneous environments. Moving to a consolidated environment in these situations may require a migration to a whole new platform.

Putting it all together is "a tall task," says James Fralick, server platform director at Manulife Financial Corp. in Waterloo, Ontario.

Manulife's consolidation was driven by the need to simplify a server environment that included 325 Intel Corp. servers running a mix of NetWare, Windows NT and OS/2, as well as 125 Unix servers running different flavors of Unix.

Consolidating this type of environment raised several questions, Fralick says. "How do we know that clashing and trashing is not happening when we combine multiple workloads on individual servers? How much resource sharing is going on inside the servers?"

And in many instances, "both Unix and NT lack the workload management capabilities necessary to provide the service levels required by business applications," says Bruce Gowan, a senior system consultant at Canada Life.

Successful consolidation also depends on being able to get top-level management buy-in, says Dave Leonard, chief technical officer at Corporate Express. Since most consolidation projects require a diversion of crucial resources, "it is important to be very clear about your objectives, the amount of cost reductions you can achieve and how much performance improvement and scalability you expect to see," Leonard says.

And don't be afraid to ask for help. Once you have your objectives clearly defined, take a partner that's done it before. Corporate Express, for instance, used Sun Microsystems Inc.'s consolidation services and hardware, while IBM assisted in the efforts at Manulife and Canada Mutual. These vendors offer a range of consolidation services, starting from asset tracking to offering massive consolidation servers with features like partitioning for separating workloads.

If done right, the benefits of server consolidation can extend well beyond the obvious costs savings. At Corporate Express, the consolidation to two 26-processor Sun servers has helped the $3.5 billion company prepare its server environment for a just-approved merger with Dutch company Buhrmann NV — also a Sun server shop. For Canada Life, eliminating 70 servers should result in better utilization of its server resources, improve its asset-management capabilities and free up crucial IT staff.

Before, "With the constant arrival of new servers, it was extremely difficult for our technical support staff to get the time to do the important things — in our case the migration from OS/2 to Windows NT," Gowan says.

Ultimately, consolidation is a means to simplify the server environment — but only if service to the business units doesn't suffer.

"I must demonstrate that I can save money, reduce complexity, reduce head count, add flexibility and maximize the capabilities of the infrastructure to my customers — all without jeopardizing their projects or server stability and availability," Fralick says. ▶

[CRITICAL SUCCESS FACTORS]

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☐ Make sure service levels don't suffer.

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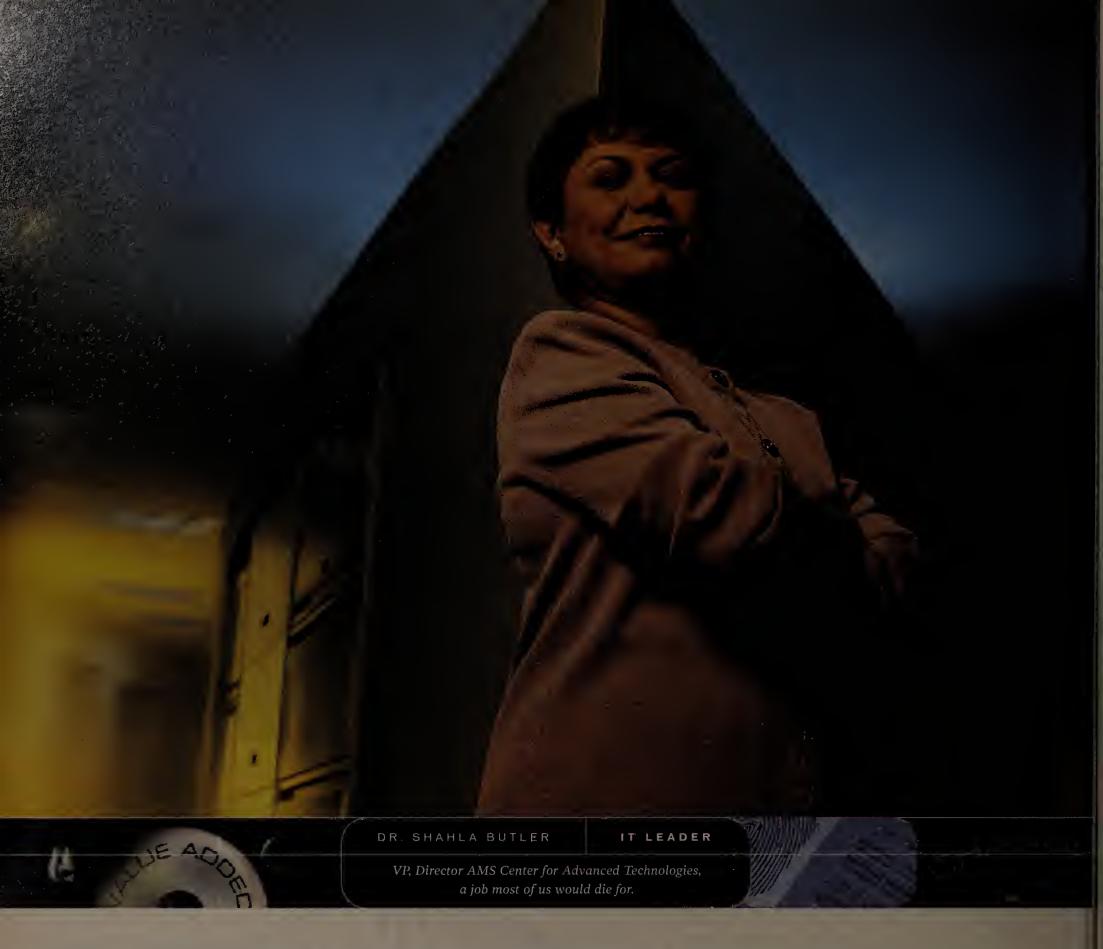
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And Now Some MINI ACTION ITEMS

BY ROBERT L. SCHEIER

MOST OF THE ACTION items we've identified for IT leaders are big-bang projects. They're not impossible, and they're all worthwhile, but, well, they all involve so much work. You know, talking to vendors, evaluating products, reviewing budgets and holding meetings.

Those of us who couldn't stand one more mega-re-engineering project need some quickie action items, things we can do while trapped on a plane or in the half-hour during the week we're not meeting to discuss, yet again, how to revamp our business model to exploit the Web. Here, then, in no particular order, are some year 2000 action items you could maybe actually accomplish before this year's wave of change blows away all your plans.

■ **Sit down with your three** most valuable staffers who aren't complaining about anything and ask them how things are going. You may uncover problems that, if not fixed, might force them out the door. This is especially important if you're (and who isn't?) reshaping your entire business around the Web. With so much change, it's easy for your reports to assume the worst if they don't hear constant updates about your progress. And if you find everything is indeed OK with them, you can cut the conversation short and feel good knowing you've done some proactive retention work.

■ **Place a call to your help desk** and see how you're treated. (This assumes you are in a position to do anything about it if you get no response or a poor response.) If you don't like how you're treated, you've got fresh ammunition to argue for change. If you are pleased, score some points by sending a thank-you e-mail to the support staff member and his or her boss. In either case, bolster your argument with even a brief reminder of how much time or money was at stake solving this IT problem.

■ **Schedule a brown-bag lunch** or two at which your mainframe operations staffers can share some of their skills in security, testing and version control with the folks running your Web site. Often, Web sites fail not because of the server or clustering software you're using, but because new components were thrown into production without being tested or configured properly. Make it clear this isn't just an opportunity for your "legacy" staff to show everyone else they're still relevant. The skills they have learned over the years in the data center are more, not less, important now that you're exposing your core applications to the public and your business partners over the Web. Scheduling these lunches after a well-publicized site meltdown will probably spur attendance.

■ **Go back over the notes** from the last management class you took or reread a chapter from the last self-help book you read. Have you been using what you learned, or did it get lost in the day-to-day whirlwind? The basics of good management, like listening before you speak and gathering all the facts before taking action, all sound self-evident when you're sitting calmly in the classroom. It's a different story when you're tired, hungry and burned out from working overtime. Take a few minutes to at least glance through your notes before you do your next difficult performance review or bring up a touchy turf issue with a fellow manager. It can save a lot of messy clean-up afterward.

[OPINION]

■ **Seek out a peer or manager** who drives you crazy, take him to lunch and listen. Ask open-ended questions about the problems he's facing and what, if anything, you could do to help. Don't commit to anything on the spot, but just listen and keep your cool, even if he starts attacking you. At the least, you'll have learned more about your company. At best, you'll have created an improved atmosphere for the future.

■ **Call three valued employees** who've left your staff in the past year and ask how they're doing. If you're lucky, they'll be miserable at the fly-by-night Web start-up that lured them away and you can steal them back. At worst, you might get the real story about why they left, which they were too polite to tell you when they quit. That information could help you fix those problems before you lose even more people.
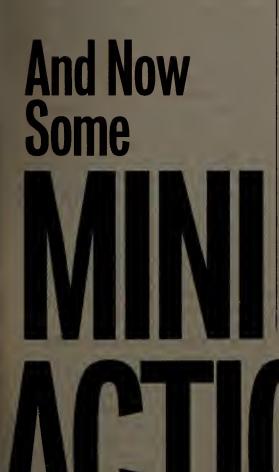
■ **Find out if all the money** budgeted for year 2000 has been spent (once you're satisfied you have a handle on your Y2K and post-Y2K processing issues, of course). If not, see if it can be applied to other business-critical IT projects that are still underfunded. See if some of those outsourcers who spent so much of your money analyzing your systems can now use the knowledge they gained to improve your business.

■ **Go to the food court** at the mall and watch how people — especially those under 25 years of age — use their cell phones. Being "online" constantly is a way of life for them. Soon many of those cell phones will have Web browsers, and they'll be sampling music, answering e-mail and buying products anywhere, anytime. Is your company, and your own skill set, ready to exploit this new way of doing business?

■ **Take a walk outside.** Yes, the world is moving at Web speed; yes, you could be doing a better job at employee retention; yes, you should read up on wireless protocols. But one person can only do so much. If you don't relax a little, you can't do your most important jobs, which are managing people and managing yourself. ▶

> ❝ **Go to the food court at the mall and watch how people – especially those under 25 years of age – use their cell phones.**

BY MICHAEL COHN

[HUMOR]

Twelve Things
NOT TO DO IN 2000

WHOA. IT CAN'T BE 2000 already. We're tired. We're beat. We really need to go home and take a nap. The last thing we need are action items . . . a to-do list for 2000.

I'm not a big fan of to-do's. From my extensive experience, I have found it's a lot easier *not* to do things. *Not* to move off DOS 3.0. *Not* to mow the lawn. *Not* to remember to pick up my in-laws at the airport, costing me three nights on the couch.

Sure, the next millennium is here. Maybe there's lots of new and exciting stuff around the corner. But let it wait a little longer. I'm still recovering from Y2K. And ERP. And e-business up the e-yingyang.

My advice for 2000? Don't do it! Don't be a hero. Don't try anything new. It's just the first year of the next millennium, so what's the rush? Take a break. From today forward, here are 12 things I definitely would *not* do:

1. Don't talk about the Y2K bug.
Don't even bring it up. Mahogany Row is still steamed about the whole thing. Because if it's a big deal, you're toast. And if it's not, then a few of the big cheeses are going to wonder what you did with an $18 million budget, 30 contract programmers, 700 gallons of bottled water and 1,200 packages of indigestible orange peanut-butter crackers.

2. Don't touch e-commerce.
Don't go there. It's too hard. Too complex. It costs too much. But I bet your chief financial officer wanders in some time before Presidents Day and asks for some fancy Web-based front end. Which can only lead to a fancier back end. And then what: a middle end? Your weekends? And eventually your rear end, when he finds out you've rolled it out to 1,600 employees who use it only to check stock quotes and surf *baywatch.com.*

3. Don't go out and buy more software.
You've got plenty left over from the last millennium. Just say no. Besides, do you know how much these software guys make? Billions! Trillions! Do you actually think it's fair that some of 'em are worth nine digits, while you debug RPG six days a week for $36,500?

4. Don't buy any more hardware, either.
Technology changes so fast, it's instantly obsolete — your average PC has a shelf life shorter than a carton of milk. Why go to the expense, time and trouble when it's new and interesting for only 15 minutes? Then again, that's what my wife said about our honeymoon.

5. Don't disband your project office.
You probably had one for Y2K. Or that ERP installation. Dozens of people managing dozens of subprojects managing dozens of subdeadlines. It's chaos. It's incredible overhead. But it can do wonders for a really big, complex project and even help a small, simple project — by turning it into a really big, complex project.

6. Don't migrate off the mainframe.
We tried it once — didn't like it. Though maybe we got carried away, since we moved off a couple 120-MIPS machines and tried to run the whole shebang on two iMacs in accounting.

7. Don't train anybody.
Waste of money. There are lots of new, bleeding-edge skills needed in the next millennium; odds are your people have none of them. But educate them and you're cooked - - they'll be out the door, bound for some Web start-up and

> ## Your average PC has a shelf life shorter than a carton of milk.

hefty stock options. If you want to try something bleeding edge, hire some big-buck consultants — and train them, because I guarantee they'll need it.

8. Don't go overboard with data security.
Hackers. Firewalls. Data theft. Viruses. Come on, what's the big deal? Security is a bunch of hype. Twenty years in the business, I've never seen a sabotage, a compromise, a break-in — nothing! I put a nested-if into production back in '87 that took payroll down longer than any stinking virus.

9. Don't let handhelds proliferate.
Big mistake. The last thing you need is a bunch of teeny-tiny devices running around with voice mail, paging, mini-hard drives and Internet access. Because I had one, and I left it on the table at Cafe Antonio's about four hours ago, and now I have to worry about data security.

10. Don't outsource.
Application hosting, legacy code maintenance, help desk outsourcing — avoid them like the plague. Don't let anything go. Who cares if there's a tiny, three-and-a-half-year backlog? Do you want to look weak? Expendable? Heck, no! Do it all! If you want something done right, do it yourself! Of course, if you want something done right away, well maybe that's another story.

11. Don't pay your 16-year-old webmaster a $10,000 signing bonus up front.
I made that mistake last August and haven't seen the kid since.

12. Don't e-obsess over customer service.
Don't jump on the bandwagon. Folks will trade a little customer disservice for the convenience of e-shopping. Who can't handle occasional downtime, lost transactions, incorrect pricing or an out-of-stock item or 10? ▶

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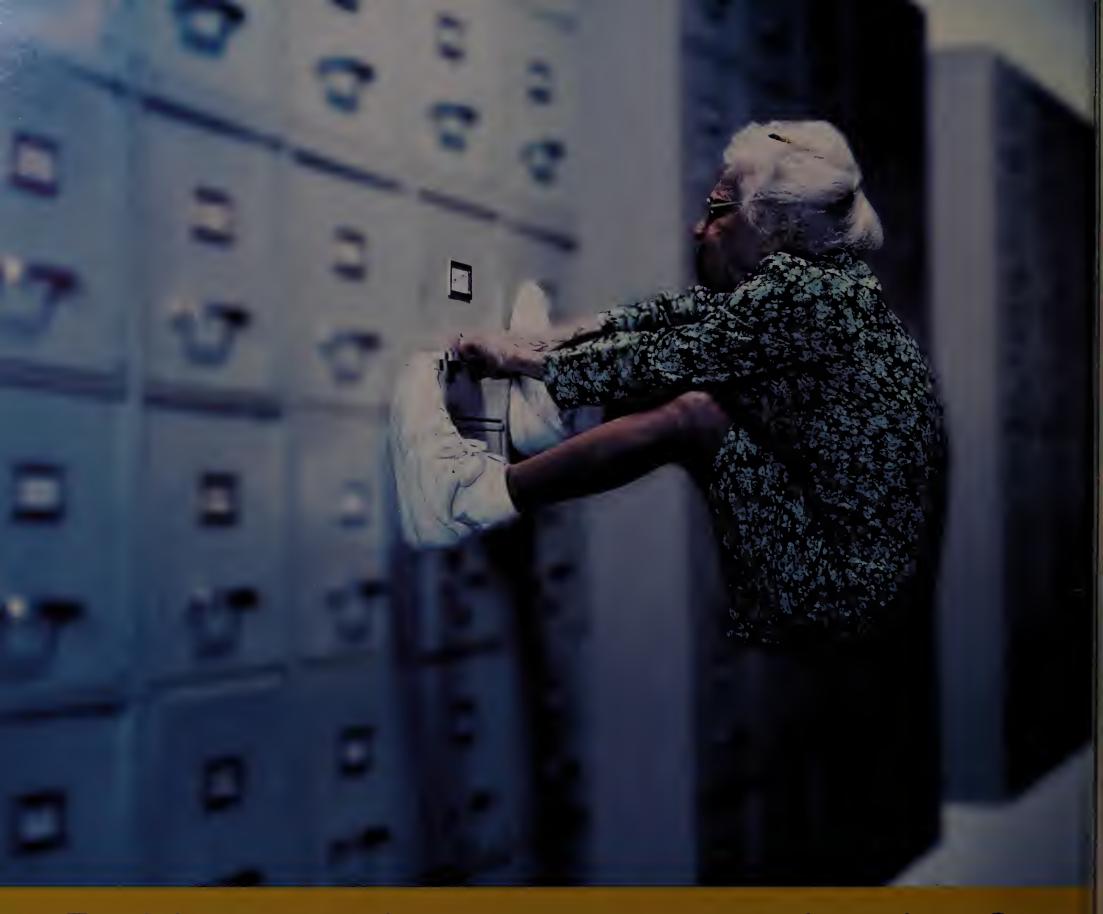
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WORKSTYLES

Unglamorous Internet

They're rich. They're glamorous. Internet workers are the envy of their friends and poster children of the new economy. Right?

Not so, say **Bill Lessard** and **Steve Baldwin**, co-authors of *NetSlaves: True Tales of Working the Web* [McGraw-Hill, 246 pages]. The two believe the media have selectively celebrated a few billionaires while ignoring the masses of Internet workers who spend long hours in dead-end jobs hoping for stock options, which, in most cases, never manifest.

Each chapter of *NetSlaves* profiles different jobs in the so-called "new media caste system." "Garbagemen," or technical-support personnel, lie at the bottom of the heap, while "robber barons," or Internet entrepreneurs, sit at the top. Lessard and Baldwin told *Computerworld*'s Julekha Dash about their view of the new economy.

Why do you describe Internet workers as "Net slaves?"
Baldwin: A lot of people [in the Internet industry] work very hard. Many do not work at a competitive wage because the industry relies on a promise – stock options. Most companies fail – I think four out of five do. They may get an angel investor at the early stages, but then there are restrictions on how [the company] can elect options. There are barriers between you and that pot of gold.
Lessard: The mainstream media has been feeding us this fairy tale that everyone [in the Internet industry] is getting rich. Not everyone who goes to Vegas hits it big in the casino. Sure, some people do well but have a lousy quality of life. Most people don't know what stock options are. They're there to make the founders rich and the shareholders rich, with no responsibility to anyone else.

I heard about a company that put bunk beds in cubicles. Companies brag about this kind of thing. People are making uninformed decisions about their career because [the industry] is filled with hype. [Employers] expect people to work as if they'll directly profit from the stock options. It's like joining a cult, working as if it's a matter of life and death.

Who's the master of these Net slaves?
Baldwin: The Web entrepreneurs, who are slaves to the venture capitalists, who have to serve the banks.
Lessard: I'm not looking to say it's the bosses' fault or venture capitalists' fault. People have to take responsibility for their own careers. They can't expect people to do right by them. We have this gold-rush mentality where people will say and do anything to get ahead, even if it means screwing them over.

Why focus on Internet workers? Aren't other information technology jobs filled with long hours and stress? How is the Internet different?
Baldwin: It's a 24/7 environment. The Internet never sleeps, and it's global. And there's pressure to maintain a Web site to the point of perfection. I can just imagine the pressure of working in an IT department of some "shop-dot-com." There's always one person taking the blame.
Lessard: The Internet is like the rest of the economy on crack. It's global and 24/7. You get paged at 4 a.m. by some guy in Hong Kong who can't change his [computer's] fonts. But concurrently, there's also a great deal of fear in business life in general. Everyone's afraid of eating cat food when they're 60. They want to believe that the American Dream is alive and well, so they throw their career at the latest dot-com.

Which job is most slavish?
Baldwin: Garbagemen. It's hardest to get out of [technical support]. Where can you go from there? You're not building or coding applications. You're not producing anything that'll make you well known. It can be a dead-end job.
Lessard: They're in the line of fire and can never make anyone happy. It's always their fault. You hear about the holiday season, how it's a banner year for e-commerce. What about the poor schmucks who work 24 hours to make sure your book gets there on time? There are real people who are doing the orders. They're getting paid lousy wages.

JIM CHAMPY

The CEO's plate for '00

THE NEW YEAR will present CEOs with a set of contradictory conditions and confounding challenges. The global economy will stay strong. Corporate profits will rise. But at the same time, competition will intensify and the rate of business change will accelerate. CEOs will privately wonder how things can be so good, yet so hard.

Most CEOs are confronting the reality of a new economy — one enabled by information technology and increasingly open global markets.

It's an economy where growth seems more important than profits, at least for a while, and where cyberspace is offering new channels to markets. At the top of most CEOs' agendas will be the challenge of keeping their current businesses running while moving to new ways of operating.

Be prepared for their actions to become increasingly radical. And expect more pressure on IT organizations, no patience for system delays and less tolerance of clumsy technologies. It's the flip side of their recognition that IT is now important.

What, specifically, will be on their agendas? The following list contains some old issues, but don't be fooled. The quality of the CEO's response will be different than in the past.
Uncover whether the IT organization has the right skills to make it to the future. Having the right people has always been a CEO issue. But today, CEOs are a lot less tolerant of team misalignment. They want the right behaviors and skills and will act more aggressively to get them. I know several CEOs who have recently changed more than half of their direct reports.

This year, the message to IT organizations will be clear: If the boss is making tough decisions on management alignment and the quality of the team, he will expect other critical parts of the organization to do the same. So take stock, and take action.
Adapt to accelerated change. Many CEOs worry about speed. They are increasingly forced to make decisions about unfamiliar technologies and market conditions. They are concerned with burnout — for their people and themselves. But in 2000, they will take as a given that nothing in technology or the economy will slow down. So they will look for ways to make their organizations more agile. This means IT organizations

Nothing in technology or the economy will slow down.

will have to get increasingly lean — fast. Dump old systems and unnecessary work.

And if you see your CEO picking up the pace, don't hope that he'll opt-out for a slower job elsewhere: There are none. No business or industry will provide cover. Moreover, many CEOs are enjoying the challenges of the new economy.
Focus on costs. Although business will be good, increased competition will put more pressure on costs. CEOs will also focus on growing the top line and increasing market share, but don't get lulled into thinking your IT budget is secure just because technology has become more important.

In 2000, CEOs will be looking to find money to enter new markets and new businesses while lowering their costs or at least keeping them fixed. At best, your IT budget will remain the same, while you will be expected to do more.
Search for value creation. For the past year, creating more customer value has been the mantra principally of marketing gurus. The problem is, no one knows how to create new customer value on a regular basis.
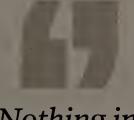
This year, CEOs will take up the mantra and the challenge. If they don't succeed, their businesses will be damned to competing only on price. The good news here is that they will turn to IT for help — but again, you will have to find the money and talent for innovation.

And are you hoping that an early retirement program for IT managers will also be on the CEO agenda? Forget it. Not at the start of the new millennium and of the new economy. ▶

Champy is chairman of consulting at Perot Systems Corp. in Cambridge, Mass., and co-author of the forthcoming book The Arc of Ambition: Defining the Leadership Journey. *He can be reached at JimChampy@ps.net. His newspaper columns are syndicated by Tribune Media Services.*

The E-lusive S

E-commerce and Internet development are driving bold hiring projections for the year ahead. But the critical question remains: Where will we find these people?

By Leslie Goff

JUST HOW DESPERATE are IT managers to get good e-commerce professionals on board? Just ask Eric Kidd. The chief technology officer and vice president of engineering at start-up Petsmart.com in Pasadena, Calif., is spending 40 hours per week — nearly two-thirds of his typical 70-hour week — on recruiting efforts alone.

Petsmart.com, a subsidiary of retailer Petsmart Inc., was launched in July and quickly jumped to the front of a crowded e-commerce category, the online pet store. But Kidd says he fears that his company's early market lead is at risk if he doesn't get ample e-commerce database, application development and quality assurance skills on board ASAP. At the same time, he's also staffing for his fledgling company's internal information technology infrastructure. In all, he plans to add 50 people this year to his 24-person staff.

"The shortage of people resources constantly prevents new projects from getting work," Kidd says. "Our business needs generate a relentless thirst for new functionality. That unquenched thirst represents losses in opportunity to expand our lead in a very competitive industry."

Kidd's dilemma isn't unique to dot-com start-ups. E-commerce, in one form or another, and other Web-based initiatives are driving a good portion of the new IT hiring (as opposed to replacement hiring) this year. Across the country, and in all industry segments, IT managers are clamoring for Internet expertise to address their needs for online shopping sites, business-to-business e-commerce, extranet and intranet application development, and — the mother lode — database support that ties it all together with back-end systems.

BUSINESSSPECIAL REPORT

taff

4TH COMPUTERWORLD'S ANNUAL HIRING FORECAST

PETSMART'S JOE KIDD estimates he spends two-thirds of his work week trying to recruit IT professionals for the company's aggressive e-commerce efforts

ALAN LEVENSON

BUSINESSSPECIAL REPORT

COMPUTERWORLD'S 4TH ANNUAL HIRING FORECAST

Overall, IT staffs will increase by an average of 4% nationwide in the first quarter and 13% during the year, according to *Computerworld*'s Annual Hiring Forecast survey, conducted last fall. Staff growth will be strongest across the South, followed by New England, based on the hiring projections of 1,912 companies, employing 447,440 computer professionals.

While overall IT staff size won't be increasing dramatically for many companies, IT hiring will remain brisk, as managers cope with continuing IT attrition. For example, at financial services firm Paine-Webber Inc. in New York, Na-

talie Leone, vice president of corporate staffing, says she expects to hire approximately 550 IT professionals this year. Of those, between 15% and 20% will fill brand-new positions; the rest will be replacements for lost staffers. Of the 400 people CIO Paul LeFort says he expects to hire this year at health care provider United-Health Group Corp. in Minneapolis, most will be replacements as well.

Hiring continues to be a challenge, given low unemployment in general and IT skills shortages in particular. "Part of the problem is that a lot of Internet technology is piggybacked on Oracle, and so everyone is screaming for the same people," says Charles Buscemi, an IT recruiter at 1-800-Flowers.com in Westbury, N.Y. "Everyone is competition," not just other dot-coms, he notes.

Take Barnes & Noble Inc., for example. The bookseller,

NATALIE LEONE, vice president of corporate staffing at PaineWebber, says she expects to hire about 550 IT professionals this year

based in New York, maintains a separate IT operation from its online counterpart, Barnes-andnoble.com LLC. But even without having to worry about dot-com initiatives, CIO Chris Troia is as strapped for database skills as everyone else. Relational databases drive all

of the company's major applications, from inventory management and merchandise replenishment to point-of-sale systems and in-store title search capabilities. Of Troia's 240-member staff, 90 are involved with database administration and development.

Beyond the database realm, competition is just as stiff for other Internet-related skills, especially Java, Microsoft Corp.'s Active Server Pages, Visual Basic and C++ application development, network architects and administrators, and Unix systems administrators. Partly because of the competition, and partly because IT shops want people who can hit the ground running, IT positions often linger unfilled as long as six to nine months, managers say — a lifetime when business is moving at Internet speed.

Petsmart's Kidd and others say they need people with at least three to five years of experience. "In the dynamic environment of the Internet, our [project] needs typically range from immediate to the very near term. We seldom have the opportunity to train or grow an individual into a position," Kidd says.

But because many of the technologies driving staffing needs are not much older than that three to five years companies are looking for — if that old — solid experience is hard to come by. That creates a vicious circle, says the technology director at a retailer based in the Southwest, who asked not to be identified.

"You don't want to hire an entry-level person, because it takes time to get people

The Top Regions for IT Hiring in 2000

RANK/REGION (STATES INCLUDED)	COMPANIES SURVEYED	PERMANENT IT STAFF NOW	3-MONTH PROJECTION	12-MONTH PROJECTION	TEMPORARY IT STAFF NOW	3-MONTH PROJECTION	12-MONTH PROJECTION
1. West South Central (Ark., La., Texas)	171	42,969	+9%	+25%	8,338	-14%	+3%
2. South Atlantic (Del., D.C., Fla., Ga., Md., N.C., S.C., Va., W.Va.)	286	89,988	+5%	+13%	7,007	-6%	-5%
3. New England (Conn., Mass., Maine, N.H., R.I., Vt.)	118	24,898	+4%	+14%	3,001	-26%	-5%
4 . East South Central (Ala., Ky., Miss., Tenn.)	71	2,996	+4%	+14%	667	-6%	0%
5. East North Central (Ill., Ind., Mich., Ohio, Wis.)	376	63,834	+4%	+10%	9,454	-4%	-4%
6. Pacific (Alaska, Calif., Hawaii, Ore., Wash.)	254	10,872	+3%	+11%	1,436	+5%	+3%
7. Mid-Atlantic (N.J., N.Y., Pa.)	306	62,381	+2%	+12%	7,453	+9%	-2%
8. Mountain (Ariz., Colo., Idaho, Mont., Nev., N.M., Okla., Utah, Wyo.)	163	98,912	+2%	+10%	5,198	-2%	-6%
9. West North Central (Iowa, Kan., Minn., Mo., Neb., N.D., S.D.)	167	50,590	+2%	+9%	2,633	+6%	-5%
TOTALS	**1,912**	**447,440**	**+4%**	**+13%**	**45,187**	**-4%**	**-2%**

trained," the director says. "You keep hoping you can find somebody, but then by the time you do, you could have trained someone."

The demand is forcing companies to make job offers so competitive that new recruits can't refuse and/or come up with innovative ways to quickly create their own expertise internally.

Even companies that see themselves as competitive are reviewing ways they can become more competitive. For example, as 1-800-Flowers makes its transition from a call center-oriented operation to an Internet-centric business, it plans to double its 60-person IT staff this year, Buscemi says. The company, located on suburban Long Island, has hired a benefits consultant to analyze the local competition and make recommendations on how to improve its own compensation strategies.

Employers that are concentrating on internal training include PaineWebber and UnitedHealth Group. Paine-Webber plans to increase its campus recruiting effort this year, hiring 150 college graduates for its Information Services Division (ISD) Associates Program. That represents a significant increase from 89 ISD associates hired last year. Each associate goes through a two-year training program during which he's assigned to PaineWebber's online initiatives, Leone says.

"We're marrying our online trading capabilities with more advice, account information, research and other tools that will make for more productive discussions between brokers and clients," Leone explains. "It's all relationship-driven."

UnitedHealth Group has created an internal Learning Institute, where "we're creating IT professionals from scratch, like we did in the old days," LeFort says. The institute accepts 50 to 80 applicants per year, mostly career transitioners, and about evenly split between candidates from within the company and without. Internet development courses are among the most crowded, Le-Fort notes, in keeping with the company's "e-health" initiatives, including offering member services via the Web and enabling small business brokers to get rate quotes online.

What's Hot in the New Year?

Percentage of IT managers surveyed who said hiring need was high in the following areas:

RANK/TECHNOLOGY	3 MONTHS	12 MONTHS
1. Application development	35%	37%
2. Networking	34%	35%
3. Internet development	32%	41%
4. E-commerce	18%	27%
5. Data mining	17%	24%

Percentage of IT managers who said the following technologies will be important:

RANK/TECHNOLOGY	3 MONTHS	12 MONTHS
1. Storage-area networks	36%	51%
2. Next-generation directories	32%	51%
3. Sales force automation	30%	36%
4. Extensible Markup Language	29%	42%
5. Windows 2000	28%	62%
6. Wireless networks	28%	45%
7. Gigabit Ethernet	27%	56%
8. Voice-over-IP	26%	44%
9. Linux	22%	36%

In the current environment, just about the only group of IT professionals possibly facing hard times this year are independent consultants. Survey respondents indicated that they will decrease their use of consultants and contractors in the first quarter by an average of 4% nationwide. With the exception of the Pacific, West North Central and Mid-Atlantic regions, companies across the country will be looking to replace contractors with full-time staff. For the 12 months overall, those regions will help boost IT contracting by 3%.

UnitedHealth Group, which has IT operations in Minneapolis; Hartford, Conn.; Greenville, S.C.; and Somerset, N.J., will cut its use of contractors by half this year, LeFort says, partly because it has wrapped up its Y2K projects.

"We used to run about 10% contractors, and we are turning 5% of those into full-time positions," LeFort says. "It's less expensive, and we're finishing up the projects that we had been using contractors for." ❯

Goff is a freelance writer in New York.

The Top Industries for IT Hiring in 2000

RANK/INDUSTRY	COMPANIES SURVEYED	PERMANENT IT STAFF NOW	3-MONTH PROJECTION	12-MONTH PROJECTION	TEMPORARY IT STAFF NOW	3-MONTH PROJECTION	12-MONTH PROJECTION
1. Gov't.: Federal/Military	108	84,849	+12%	+5%	2,782	+3%	+3%
2. Value-added resellers	95	26,628	+9%	+29%	2,993	-5%	+6%
3. Financial/Insurance/ Real estate	144	31,340	+9%	+19%	3,260	+16%	+32%
4. Trans./Utilities/Comm.	132	68,537	+8%	+25%	5,792	+12%	+27%
5. Software development	106	25,692	+7%	+21%	2,709	+1%	+16%
6. Banking	58	7,920	+5%	+11%	1,155	-2%	+2%
7. Health care/Medical	149	16,691	+4%	+17%	2,379	-11%	-22%
8. Education	210	24,063	+4%	+9%	3,506	+9%	+9%
9. Computer mfg.	40	281,512	+3%	+14%	26,765	-4%	+1%
10. Wholesale/Retail	80	9,359	+3%	+10%	605	-6%	+7%
11. Mining/Const./Petrol.	60	16,364	+3%	+9%	6,461	+5%	+12%
12. Manufacturing	314	192,774	+3%	+8%	13,265	0%	+2%
13. Gov't.: State/Local	132	29,778	+2%	+8%	1,516	+13%	+17%

With Y2K finally come, what can IT consultants expect to be the next big areas of opportunity? Actually there are lots of them, but only big thinkers need apply
By Bronwyn Fryer

EDWARD TAYLOR of Collective Technologies says "massive data-storage requirements brought about by universal access to company resources are producing a need for people with [database administrator] and related skills"

WILL VAN OVERBEEK

ISKA JOHNSON, hired last June as an IBM consultant, has her eyes on the prize. Armed with an MBA with an emphasis in information systems management from the University of Minnesota, Johnson's goal is to become a practice leader in IBM's global IT practice.

To that end, she's learning everything she can about key acronyms like BI (business intelligence or business integration) and CRM (customer relationship management). These are among the areas that analysts and observers predict will be hot in the next couple of years. "I'm building a broad repertoire of experience so that I can move into a principal position within IBM," the Minneapolis-based consultant says.

With pre-year 2000 projects wrapped up and mop-up work begun, information technology consultants like Johnson are now faced with a brave new world of opportunity. Trends toward globalization, mergers and acquisitions, corporate divestitures and joint ventures are driving the need for experienced consultants who can take the 30,000-foot view of corporate information systems.

Others agree. *Computerworld* interviewed a variety of recruiting firms, IT hiring managers, industry analysts and consultants to discover the areas of significant opportunity for consultants. Interviewees identified several broad areas of expertise that they believe will be in significant demand for the next few years.

CRM, Procurement Hot

No longer is a deep computer-science background, experience with specific programming languages or even experience with broad application areas such as SAP enough to guarantee success as a consultant, observers agree.

"You still need strong analytical skills, but there's a shortage of people who are good thinkers who have good relationship skills," notes Kevin Campbell, mar-

ket leader for products and a partner in the global operations practice at Ernst & Young LLP in New York.

As companies try to leverage their expensive investments in enterprise resource planning (ERP), consultants who once specialized in SAP implementations shouldn't expect to sit on their laurels. "ERP consultants will find their salaries reduced by half" unless they begin to think about leveraging their skills to incorporate broader business integration skills, warns Campbell.

Within the overall umbrella of business integration, experts agree, the biggest areas of growth in IT consulting are:

CUSTOMER RELATIONSHIP MANAGEMENT. CRM applications — and all their attendant and supporting technologies — will present huge opportunities for consultants.

Case in point: Keith Costello, vice president of worldwide marketing and strategy at Oracle Consulting, says his organization has seen a 238% increase in demand for consultants with a background in CRM systems in the past year, and that demand shows no sign of stopping.

ERP/ONLINE PROCUREMENT. This area of ERP is Oracle Consulting's second-fastest growth area. The company has posted a 202% growth in requests for consultants with expertise in procurement during the past year, Costello says. Companies believe procurement systems will help them shave huge expenditures from their bottom lines. "Our clients see savings in nonproduction procurement as an area of tremendous opportunity," he notes.

Campbell observes that consultants who specialize in "blending the ERP world of the past with the Web world of the future," so that their clients can procure and process nonproduction goods and services online, face a tremendous growth opportunity.

CONSULTING'S
Next Big Thing

Caring for Data

Increasing interest in CRM and Web-based procurement systems means companies will need the help of experts in the following areas:

DATA WAREHOUSING, MINING AND MANAGEMENT. Database administrators — particularly those with a detailed knowledge of indexing, tuning and operating systems — will be in high demand, says Edward Taylor, president of Collective Technologies, a national IT consulting firm based in Austin, Texas. "Massive data-storage requirements brought about by universal access to company resources are producing a need for people with [database administrator] and related skills," Taylor says.

NETWORK INTEGRATION. As more and more business is conducted via the Internet, intranets or extranets, knowledge of network integration will be key, predicts Alex Salehi, a vice president at Novell Inc. Consultants who are adept at simplifying and streamlining networks will have plenty of work to do. "Our clients are saddled with increasing costs, due to the administration requirements of the network," Salehi notes. Thus, he says, consultants who can integrate cross-platform directories or help clients simplify their network management will have ample opportunity going forward.

SECURITY. Consultants with experience in security issues will be awash in work in the new year. "Companies are very interested in having services and technology related to understanding their risks and minimizing their vulnerabilities," Salehi says. Companies are keen on hiring people with experience in preserving data integrity and with knowledge of backup and recovery tools and strategies, particularly for large databases.

LINUX. Yes, Linux, too, is coming of age. It's no longer considered an operating system "just for print and file services of firewalls," says Taylor. "Linux is becoming a serious contender for the corporate marketplace. Several large companies that hire Collective Technologies' consultants "are considering massive Linux conversions," he adds.

Know What You Know

Interviewees agreed that narrow-minded consultants who hunker down over their specific knowledge of tools or languages without paying attention to the big picture may find that they go out to nice dinners less often than those who can claim experience with broad architectural issues.

"Consultants have to think of moving from a one-dimensional world where they understand a single technology to a three-dimensional world in which they have to mix together various business options," insists Campbell. "You have to be part salesman, part technologist and part architect — those aren't things IT departments have internally. The key outside people will be the ones who can think through various technology options and understand their business effects."

PROJECT MANAGEMENT. Likewise, experienced project managers will be in high demand, says Irene Dec, vice president of operations and systems and chief Y2K overseer at Newark, N.J.-based Prudential Insurance Corporation of America. Like Campbell, Dec says that the most successful IT consultants are those who are able to grapple with the big picture and ensure that the projects stay on target and within budgetary guidelines.

"Many IT professionals have studied the technologies, new languages, products and so on," she says. "But without project managers to drive and implement the technology, businesses will not succeed."

KNOWLEDGE MANAGEMENT. This is another nascent but fast-growing area of opportunity for IT consultants. Why? "When a key individual receives 250 e-mail messages every morning," there's a knowledge overload, says Rich Azzarello, a principal at IBM's Knowledge Management Consulting and Solutions Group in Jericho, N.Y. And e-mail overload, he says, is symptomatic of a firm with a need to manage information coming in.

Enter IBM's army of consultants. "Demand for systems and processes supporting the collection, sharing and management of knowledge has dramatically increased over the last few years and continues to increase," says Azzarello. "Clients are telling us, 'I need a repository so anyone can know what they know when they need to know it.' "

Thus, consultants who can help construct systems that cut through the noise and build Web-based "knowledge portals" that funnel and push the right information to the right people at the right time and allow them to collaborate with one another will be key.

BUSINESS INTELLIGENCE. Business intelligence — which IBM defines as the "gathering, management and analysis of large amounts of raw data on a company's customers, products and services and all the transactions in-between" — is another category of opportunity for those with specific knowledge of individual industries such as finance, communications or health care, says Azzarello.

Observers say the next few years will prove to be salad days for consultants who can see beyond the particular to the horizon. "The shortage of these resources is endemic throughout the industry," says Salehi. "We intend to meet our customer needs by growing the pool of resources with needed skills." ▶

Fryer is a freelance writer in Santa Cruz, Calif.

As Y2K worries fade, IT execs plan to boost spending on strategic projects while cutting costs overall in the new year. One key target for the chopping block: consultants and contractors By Gary H. Anthes

CIOs SOMETIMES FEEL that they've been given a "mission impossible:" to do more for their companies while spending less. But some information technology executives are promising to do just that this year, saying they'll step up investments in strategic projects such as e-commerce while reducing costs overall.

Saving some money will be as simple as falling off a log. Costs associated with the year 2000 problem will just go away. But other cost savings will be won only by hard work. "We have been fighting for the elusive [software] reuse concept for years," says Tsvi Gal, chief technology officer at Merrill Lynch & Co. in New York. "We achieved quite a lot [in 1999], and we expect to achieve much more [this] year."

Indeed, there's plenty of fat to be trimmed in IT budgets. According to Meta Group Inc. in Stamford, Conn., $82 billion in worldwide IT spending last year was "wasted, severely under-utilized, poorly implemented or ineffectively deployed," and that waste will rise to $90 billion this year.

In a recent *Computerworld* survey of 101 IT managers at midsize and large companies, half the respondents said their budgets would rise this year. One-third said their spending plans would stay the same and 17% said they would fall. For those saying budgets would shrink, the average decline was 22%.

The area most-targeted for cuts is spending on consultants and contract labor, with one-third of survey respondents — even those predicting bigger budgets overall — saying they would cut back in that area. They said that, on average, they had devoted 23% of their

JUST BE DISCIPLINED: Gerald Stevens CIO Steven Nevill says the strongest cap on IT costs comes from old-fashioned discipline and strong fiscal management

EYES ON THE IT W

BUSINESS

IT staffs, including contractors, to the Y2K effort in 1999, and that number will plummet to 6% this year.

Little Consensus on Cuts

But with the exception of Y2K, *Computerworld* found little consensus among IT managers on how best to cut or control costs. Some plan new ways of working with vendors — by outsourcing, renegotiating contracts and setting up shared-services arrangements. Others look for computer purchasing and maintenance cost savings through the use of thin clients and server consolidations.

Still others hope to trim costs by reusing software and using freeware. A few pin their budget-cutting hopes on fiscal discipline and the ability to just say no to some requests.

The big thing this year, Gal says, will be shared-services arrangements, in which several firms share activities such as Web hosting and server management. That might involve Merrill Lynch and others taking an equity position in a company set up to provide those services. "It's something I will be discussing with other [Wall] Street chief technology officers," he says.

A related effort at Merrill Lynch is a 10-for-1 server consolidation in which the company will replace thousands of existing Windows NT and Unix servers with hundreds of larger boxes. That will significantly reduce the labor required to maintain the servers, and it will also result in fuller use of capacity, according to Gal.

The server consolidation will take about three years, Gal says. Meanwhile, Merrill Lynch engineers are working with Microsoft Corp. and Sun Microsystems Inc. to improve the robustness and scalability of the NT and Solaris operating systems. The server consolidation and the shared-services arrangement could knock 25%, or several million dollars, off Merrill Lynch's server costs, Gal estimates.

Of Merrill Lynch's software reuse initiative, Gal says, "We are trying to create a culture in which stealing [from your own prior work] is blessed more than innovation." He says Merrill Lynch has standardized on Microsoft's Distributed Component Object Model for Windows NT and on the Unix-based Common Object Request Broker Architecture for sharing software components. Reuse varies by application and will range from 20% to 80%, he says.

Dick Hudson, CIO at Global Marine Inc. in Houston, says he'll cut spending about 10%, or "six figures on a seven-figure IT budget." About 80% of that will come from eliminating Y2K consultants who will no longer be needed. The balance of the savings will come from reduced overseas travel for IT staff as a result of a new teleconferencing system. "Our trips to Europe will be cut dramatically," Hudson says. "When we put in new systems, instead of sending my people over there for three or four days of hand-holding, we'll have a series of videoconferences." Other departments at the offshore drilling company will see savings as well, he says.

Hudson says capital investments in some other new applications will also have quick payoffs. For example, a new purchasing system that includes a supplier-accessible extranet will give Global Marine purchasing employees 30% to 60% gains in efficiency. "In our tests, we are seeing some monster productivity enhancements," he says.

Despite a "significantly increasing" budget for e-commerce, CompUSA Inc.'s seven-figure IT budget will remain basically unchanged this year.

The secret for holding down the cost of IT is to outsource much of it, says Honorio Padron, CIO at the Dallas-based computer retail chain. CompUSA has turned over data center operations, application development and basic support for the implementation of its enterprise resource planning (ERP) system to IBM.

Outsourcing Can Help

"Outsourcing brings about an element of discipline you don't have if everything is internal and people can just tell you, 'Go get me some more,'" Padron says. "And it's not just discipline for the IT department, it's discipline for the whole company."

The discipline comes from having to go through a formal procedure for negotiating with the vendor, calculating a return on investment, getting management approval for requests and so forth, he says.

Padron says he'll seek to renegotiate existing contracts to take advantage of greater competition and lower prices, a process he calls "leveraging the marketplace." He has been especially successful in the telecommunications arena as prices have plunged, he says.

Panasonic Co. in Secaucus, N.J., is another company finding gold in the contract renegotiation process. If you're in the first six months of a three-year contract, the vendor isn't likely to be receptive to a request for a better deal, says Panasonic CIO Robert Schwartz. But if you're entering the second year of a two-year agreement, expect some flexibility, he says.

Schwartz says his $100 million IT budget will rise 4% to 8% this year as a result of "infrastructure investments," such as an ERP rollout and work on supply-chain and customer relationship management systems.

But he says he will offset that in part with cuts in his consulting and supplemental staffing budgets. He says he hopes to get economies of scale by getting consultants and temporary workers from fewer sources. He says he's also looking at the possibility of having his requests for supplemental staff flow through a company that will post "personnel requisitions" on the Internet.

Completion of year 2000 work will save Panasonic $6 million to $8 million next year, Schwartz says. It hasn't been decided yet what will happen to that money, but he says he'd like to keep it and plow it into infrastructure projects.

Gerald Stevens Inc. in Fort Lauderdale, Fla., is letting the natural progress of technology work in its financial favor. The company, which sells flowers and gift items both online and through retail stores, now pays $1,500 or less for a desktop PC, compared with $2,500 just two years ago. It uses the Apache Web server freeware and will consider the use of the Linux operating system as well, says CIO Steven Nevill.

And the company employs thin-client PCs on the desktop, off-loading most software to the server. "There's at least a 25% savings that you pick up because of fewer end-user support people — people that would have to go to users' desks to fix something," he says.

Disciplined Approach

But Nevill says the strongest cap on IT costs comes from old-fashioned discipline and strong fiscal management. He must approve any expenditure outside the budget. "We have a very strong chief financial officer," he says. "Even though he's a peer, all of us understand that his job is to ensure that we end up on our numbers for [Wall] Street."

That kind of IT buying discipline is sorely needed, according to Meta Group. The research firm says the average large company that had 25 people with substantial IT purchasing power in 1975 now has 300 with that authority, but not all of them are inside the IT organization. "Approximately 12% of all IT investments are delivering negligible or even negative return on investment," says a Meta Group report.

When asked what advice he'd offer CIOs struggling to cut costs without sacrificing service, Global Marine's Hudson says, "We are kind of like being in a hurricane in a rowboat. I wish I had some succinct words of wisdom the world could hang on." ▶

Budget Target: Consultants, Contractors

Compared with 1999, will your spending on IT consultants and contract labor this year increase, decrease or remain about the same?

Decrease 34%
Same 39%
Increase 25%
Don't know/ no answer 2%

By what percentage will your budget for IT consultants and contract labor increase or decrease?

For those who said it would increase (25), the mean was 16%
16%

For those who said it would decrease (34), the mean was 30%
30%

SOURCE: *COMPUTERWORLD* RESEARCH SURVEY OF 101 IT MANAGERS AT ORGANIZATIONS OF AT LEAST 500 EMPLOYEES. JULY-AUGUST 1999

> We are trying to create a culture in which [software reuse] is blessed more than innovation.
>
> TSVI GAL, CHIEF TECHNOLOGY OFFICER, MERRILL LYNCH & CO.

Intellectual Property

BY STEVE ALEXANDER

As the pace of technological innovation increases, there are frequently conflicting claims over who "owns" new developments. Such disputes are resolved under the nation's intellectual property laws, which attorneys see as checks and balances that protect innovation while deterring excessive claims of technology ownership.

Sometimes intellectual property disputes arise over patents. One recent example is a patent issued to St. Louis-based aircraft manufacturer McDonnell Douglas Corp. for the "windowing" year 2000 remediation technique. In windowing, some two-digit years, such as 99, are assigned to the 20th century, while earlier years, such as 11, are assigned to the 21st century. The company transferred the patent to its inventor, Bruce Dickens, who announced that he would demand an up-front fee and royalty payments from every corporation that has used windowing.

Can You Keep a Secret?

In addition to covering patents, intellectual property covers products and personal technical knowledge, as information technology workers who change jobs sometimes find out when they or their new employers are sued for theft of trade secrets. Jonathan Band, an attorney at the Washington office of San Francisco-based Morrison & Foerster LLP, says, "In the old days, it wasn't such an issue because someone would work for IBM for his whole career. Now people work for a couple of companies and then start their own companies.

"Plus," he added, "things are more complicated now. In the old days, employees were asked to sign nondisclosure agreements [about technology that was considered a trade secret]. Now, as people bounce from company to company, sometimes as contractors, sometimes as employees, they

> ## DEFINITION
>
> Intellectual property is intangible property that can be protected under federal law because it's considered proprietary to a company or individual. In information technology, examples include software, text, certain software algorithms, brand names, customer databases and trade secrets.

> "To patent an invention, it must be novel — new and different — and nonobvious.
>
> **KENNETH K. DORT,**
> **PARTNER,**
> **GORDON & GLICKSON LLC**

are sometimes asked to sign agreements and sometimes they aren't. It's all very sloppy because it's not clear what IT workers agree to."

As for Dickens, will he prevail and send legal ripples throughout the world of IT innovation? Kenneth K. Dort, a senior litigation partner at Gordon & Glickson LLC in Chicago, says he doesn't think so — largely because of some built-in safeguards in intellectual property law that weed out ideas that shouldn't be protected.

"Most people don't think the Dickens patent is valid," Dort says. "To patent an invention, it must be novel — new and different — and nonobvious. Most people view this approach as obvious. The standard for obviousness is, 'Would someone in the cutting edge of the relevant art think it was obvious?' Most people think that masking the date in software, as windowing does, is not all that ingenious."

But what if Dickens' claims are upheld? The claims are based partly on an important 1998 federal appeals court decision, the State Street Bank & Trust Co. case, says Jeffrey R. Kuester, an intellectual property attorney at Thomas, Kayden, Horstemeyer & Risley LLP in Atlanta.

In that case, a federal court expanded on the idea that software should be patented rather than copyrighted when it upheld a patent covering a business method of calculating financial information. Patents are believed to be the stronger legal protection, so the decision opened the door to patenting business methods. Kuester says he sees mixed results for IT if Dickens prevails.

"The patent would effectively give him a limited-time monopoly, and innovation would be encouraged from that perspective," Kuester says. "But another way that innovation occurs is by people using existing technology as a footstool to better technology. Software is unique in that it involves borrowing from other systems and solutions. If Dickens is successful, will people innovate in the future by incorporating known software technology into their new solutions? The

answer is, 'Maybe not.' "

Band says that even if the Dickens patent stands up, its impact may not be far-reaching.

"You can have a legal case, such as the State Street Bank & Trust decision, which goes beyond the specific facts of the case and establishes new legal doctrines," Band says. "I don't think that will come out of the Dickens patent. I think it could ultimately have a limited impact in that it would affect people who did Y2K work, but it doesn't have implications for anything else."

Can't Take It With You

Intellectual property law also deals with how technical knowledge affects IT workers' jobs. When Seattle-based Amazon.com Inc. hired 10 former IT employees of Wal-Mart Stores Inc., Wal-Mart sued, alleging theft of trade secrets. The case later was settled out of court. But Bentonville, Ark.-based Wal-Mart didn't have a strong case because it hadn't clearly explained to IT employees what information it considered to be secret, Dort says.

The IT technology at stake involved modern data warehousing, but suits of this type are hardly new. For many years, technology firms have been sensitive about IT people leaving companies and taking their technical know-how with them.

"It's still as big a problem as [it has] ever been," Kuester says. "Any knowledge that employees take with them that is considered to be a trade secret of the former employer cannot be used to implement a solution for the new employer. But the problem is that not all companies require employees to sign agreements that cover this, and many employers are not even clear about what is a trade secret. As a result, many IT employees don't know what they can and cannot use if they leave."

How do such cases get resolved? Unless a company can prove that a former employee has improperly used its trade secrets, the courts tend to side with the worker, Dort says. ▶

Alexander is a freelance writer in Edina, Minn.

Facts? Or Protected Data?

Intellectual property law is in a state of flux, and the big issue this year will be whether Congress votes to extend legal protection to factual information contained in databases, says Marc Pearl, general counsel and senior vice president of governmental affairs at the Information Technology Association of America in Arlington, Va.

Some companies that compile databases want such protection, while other companies oppose it for fear that widely used data such as basketball scores or stock quotes suddenly could become legally protected – and thus restricted – information.

Jonathan Band, an attorney at the Washington office of San Francisco-based Morrison & Foerster, says he would rather not see today's intellectual property laws changed because he believes they provide a good balance between enough protection for technology developers and enough freedom to promote technological progress.

"We need to have intellectual property laws because we need some incentives for people to invest in the development of innovative products," Band says. "But if there's too much protection, it stifles innovation. If a person with a previous invention can stop me from doing something new based on what he or she did, I will never be able to do anything."

– Steve Alexander

" Dear Career Adviser:

I currently work as a PC/LAN specialist at my company and have been asked to become our webmaster. I am trying to figure out where to start. I have some basic programming skills (Visual Basic 6.0) and have worked with a few graphics applications.

What path should I follow to become a webmaster, and where should I go for training?
— WEBMASTER IN THE MAKING

Dear Webmaster:

Part of the answer depends on whether you're being asked to do fairly rudimentary tasks involving just basic knowledge of HTML, updating site content and fixing broken links vs. a more complex job requiring demonstrated abilities with SQL, Perl, Java and C++ within a Web context.

"Start with the basics, including HTML and optimizing graphics for the Web, and don't forget to build your own site," suggests Bill Stephens, a Web systems analyst at Miller Freeman Inc. in San Francisco. Then continue learning based on your current environment.

If your company is a Windows NT shop, Stephens recommends adding Microsoft Active Server Pages to a webmaster's database skills; for Unix environments, he recommends Perl or Personal Home Page and, for front-end work, JavaScript or Flash. But don't stop there — top webmaster careers involve senior development skills based on Common Gateway Interface (CGI), Extensible Markup Language, streaming media and information architecture, not to mention image and site optimization, plus extensive knowledge of hardware and server configurations.

" Dear Career Adviser:

I have a bachelor of arts degree and a master's in computer science, with five years of information technology experience — four in Novell network administration and Web development (HTML and CGI) and one year in object-oriented programming in Java. I am also completing my MBA. Should I seek a more technical job as an application architect, foregoing the use of my MBA for now, or start a new career in project management?
— DECISIONS, DECISIONS

Dear D-Squared:

Both paths are valid, with the only hang-up perhaps later on if you choose project management and want to return to more technical roles. But project management jobs are up-and-coming, and your MBA and application development experience are great qualifications.

Project managers typically develop and track a detailed list of component tasks, costs and the schedules required to develop, test and deliver a product or service on time. They need real-world knowledge of what it really takes to deliver complex implementations and must get accurate, realistic updates from co-workers, communicating the bad news about potentially missed deadlines and cost overruns to product stakeholders and sponsors.

"If you're uncomfortable with the communications piece, this job might not be for you," counsels Jean Fuller, an independent project management recruiter in San Carlos, Calif.

" Dear Career Adviser:

I'm an experienced technical writer in Silicon Valley with a major hardware manufacturer. It's year's end, and I want to see if I can become a contractor with my current employer, as I see people here on a contract basis who are making a lot more money than I am. How should I approach my current employer with this idea? — INDEPENDENT IRA

FRAN QUITTEL is an expert in high-tech careers and recruitment. Send questions to her at www.computerworld.com/career_adviser.

Dear Independent:

A wise employer would nix this change in status unless you're starting your own company to offer the services you currently offer personally. Here's why: If your employer, desk, supervisor, employer-provided equipment, e-mail address within the company and your place on the organizational chart all remain the same, you're still an employee to the IRS.

This opens your employer to potential penalties — including back wages, tax payments, benefits and other fines — if your status is examined, a scrutiny which could befall you if you're part of the company's 401(k) and pension plans.

If you really want to become a contract employee, go elsewhere to start your business, advises attorney Jeffrey S. Sloan at Landels, Ripley & Diamond LLP in San Francisco. Your status as an independent consultant is stronger if you're not with the same employer.

Also develop a consulting contract, advertisements for your business, separate business cards with your own business name on them and even a Hotmail account so you can access your e-mail without being on a company's internal e-mail roster.

Make sure you're setting your own hours and your business has the opportunity for profits and losses. Because the IRS is always looking to collect taxes due, you're in a stronger position if you set up your own corporation. ▶

BRIEFS

Smartship.com Launches New Site

SmartShip.com, a Web-based company in Irvine, Calif., that provides personalized shipping information, launched its new Web site late last month.

The site allows consumers and businesses to compare the shopping rates of major national, international and regional package couriers, including Airborne Express, Federal Express Corp., United Parcel Service of America Inc. and the U.S. Postal Service. The Web site also provides information on courier drop-off locations, driving directions to shipping centers and the location of the nearest drop-off site.

Master's Program

Boston University's Metropolitan College is launching a master of science degree in electronic commerce – one of the first colleges in the country to do so. Designed to fit the schedules of working professionals, the 10-course program will begin this month and can be taken part time or full time. Each class will consist of 30 to 35 students with at least three years of work experience.

Security Deal

Countrywide Home Loans Inc., a national mortgage lending and servicing company, has awarded Stratesec Inc. in Sterling, Va., a contract for security systems expansion at its Legacy Business Park regional facility in Plano, Texas. Countrywide recently built two buildings at its Legacy campus. Stratesec will also integrate and upgrade the existing Plano building's security systems.

Training Online

Compuware Corp. in Farmington Hills, Mich., has launched Uniface@cademy, a training curriculum for application developers. Uniface@cademy's Developer's Club includes a meeting room for peer-to-peer communication, plus self-help and online coaching facilities. There is also a library and online instructors for entry-level and advanced subjects. From the home page (www.compuware.com/uniface), visitors can click the Uniface@cademy icon to gain access to the site.

Customer Centers

Waltham, Mass.-based Send.com, an online gift service, has selected Blue Pumpkin Software's Prime-Time workforce management solution to help improve its call center operations. The product was designed to optimize the scheduling of agents in customer contact centers.

Over Fifty

Scudder Kemper Investments Inc. in Boston is offering a new Web site (aarp.scudder.com) for investors age 50 and over. Launched by the AARP Investment Program from Scudder, a family of mutual funds crafted to meet the investing needs of older Americans, the site is available to both shareholders and guests.

It provides investors who are 50-plus with a wide variety of tools, a broad range of educational materials and large, easy-to-read fonts.

Census Update

The U.S. Bureau of the Census has awarded a $2.6 million project to develop mobile field collection solutions to the team of RS Information Systems Inc. in McLean, Va., and HTE-UCS, a wholly owned subsidiary of HTE Inc. in Lake Mary, Fla. The bureau will move to an automated field data collection solution to replace the current method used: pen-and-ink updates to paper maps to record the locations where people live.

TECHNOLOGY

WEBIFYING THE MAINFRAME

To keep up in the Internet economy, companies have to extend mainframe applications to the Web. But to ensure a successful project, veterans say you must find the right tools, decide where to place the business logic and find an Internet service provider that can handle mainframe applications. ▸ **106**

DIRECTORY SYNCHRONIZATION

Directory information synchronization is a necessity today. Otherwise, the massive amounts of data stored in directories, coupled with the multiple platforms found in most enterprise networks, would make administration and support just about impossible. Start-up NetVision has positioned itself to capture a piece of the directory synchronization market. ▸ **110**

APPLE'S iBOOK

Apple's new laptop takes a different tack than Windows notebooks, relying on Universal Serial Bus ports for expansion. Available in two colors, the iBook's flashy design is just one feature of a powerful, capable and inexpensive computer, our reviewer says. Equipped with a carrying handle, a full-size keyboard, a 300-MHz PowerPC 750 processor and 23M bytes of SDRAM, it weighs in at a mere 6.6 lb. ▸ **103**

ASG TAKES OVER CA TOOLS

Three years after refusing to permit Allen Systems Group (ASG) to take over the VSE tools that Computer Associates acquired from Legent, the Justice Department is now allowing ASG to take over tools that CA acquired from Platinum. ASG's plan is to build up its product arsenal through acquisitions. ▸ **102**

THE WIDENING LAPTOP GAP

The gap between prices for high- and low-end laptops is widening. Inexpensive notebooks for handling on-the-road chores start at less than $1,500, while ruggedized portables for harder use and high-end multimedia systems can cost $5,000 or more. *Computerworld* gathered three portable systems with prices that range from $1,400 to $4,995 to see what we could really get for the money. ▸ **104**

WEB EVANGELISTS

In the burgeoning Internet world, there are plenty of opportunities to create a role — and a title — of your own making. All you need are the abilities to take a broad view of Internet-related business opportunities, to serve as a single voice of clarity, to evaluate and recommend technology solutions and to deal effectively with budgeting, scheduling and resource allocation. ▸ **114**

DOES THIS PHOTO look good? We think so. The Dimage captured this image from a 35mm color negative. Even up close (insert), it's pretty sharp

HIGH-RES IMAGES; LOW-RES PRICE

GOT A BIG INVESTMENT in old-fashioned film cameras? Minolta's Dimage Scan Dual film scanner puts 35mm film and slide images online for less than the price of a good digital camera. And its 8-megapixel resolution is hard to beat. Add Epson's Stylus Photo 1200 printer and you have a complete photo studio for less than $750.

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Allen Systems Gets CA Buyout Spoils

Feds allow vendor to buy mainframe management tools acquired from Platinum

BY SAMI LAIS

THREE YEARS after turning down a similar bid, the Department of Justice has given Allen Systems Group Inc. (ASG) in Naples, Fla., the right to buy and market mainframe management tools orphaned by a Computer Associates International Inc. buyout.

The Dec. 3 decision approved ASG's purchase of six tools — four for use with MVS and two for use with VSE — that the Justice Department had ordered divested with CA's June purchase of Platinum Technologies Inc.

The approval surprised some industry watchers because three years ago, the Justice Department came up with a laundry list of reasons to turn down ASG's bid to buy the VSE management tools CA had been ordered to divest in its purchase of Legent Corp.

The department stated its reasons for denying the bid in an October 1996 filing, repeatedly quoting a report by Boston consultancy The Yankee Group, which said the following about ASG:

■ The company appeared to lack the financial resources to acquire the products and provide support and development to compete effectively.
■ It had little VSE experience, expertise or reputation.
■ ASG derived about half of its revenue from products that support CA's hierarchical database product CA-IDMS, which made ASG "critically dependent" on the continuing availability of CA's proprietary software as well as continuing cooperation and information from CA.

The Legent tools were instead sold to Belgium-based software vendor BIM Systems Inc.

Howard M. Anderson, managing director of The Yankee Group and author of the report, said he stands by the report's accuracy at the time of its publication. But "I don't follow them now," he said.

Although ASG was and is the wrong choice to handle the VSE tools, it could be the best choice as a buyer for the MVS tools, said Pete Clark, technical support manager for photography firm Olan Mills Inc. in Chattanooga, Tenn. A VSE expert, Clark was an adviser to the Justice Department in the 1996 divestiture and again in the Platinum case.

Exclusive of the 42 Platinum employees it's hiring, ASG has about 32 developers working on VSE products, a company spokesman said.

Developments Continue

Development of all six Platinum tools will continue, and ASG will immediately take over support of them, said Steve Avalone, ASG product manager. Next month, ASG will publish road maps on each product, said Steve Morgan, ASG senior vice president for marketing.

Privately held ASG, which claimed $32 million in revenue for 1998, may not have abundant financial resources, but few other viable buyers exist, said Paul Mason, a consultant at International Data Corp. in Framingham, Mass.

Anderson held out the possibility that ASG has changed more than may be apparent.

By the end of 1998, ASG had reduced its financial dependency on CA. Revenue derived from sales of the CA-IDMS products had shrunk to less than 20%, Mason said.

ASG has been broadening its base of products and revenue, buying companies and tools in an effort to transform its collection of utilities into suites of productivity tools running on IBM MVS, as well as on Unix and Windows NT, said Avalone.

To supply what Avalone called the heart of ASG's planned enterprise management suite, the company last year bought the Amsterdam-based Manager Software Products Inc. (MSP) so it could acquire the company's DataManager enterprise repository, which is a database of information about applications.

But ASG also killed the Dutch company's LAN repository, InfoSpan, in favor of its own product, Vista, said Michael Blechar, an analyst at Gartner Group Inc. in Stamford, Conn.

Because LAN and mainframe repositories such as Rochade from Phoenix-based Viasoft Inc. share an underlying architecture, users can exchange data between them.

The two repository products that were owned by MSP didn't share an underlying architecture and thus couldn't exchange data. MSP had built a bridge that let users query both repositories. But even that limited functionality doesn't exist between DataManager and Vista.

But in a move that was more welcome to users, ASG developed a Web-based access tool for DataManager, and that has attracted new users, Avalone said.

Ferman Carr, data dictionary administrator at Ross Laboratories in Columbus, Ohio, has used DataManager for nearly 20 years. The company had opted not to upgrade to the graphical user interface version of DataManager, but because of the new "Web enabler, which lets you access the dictionary [from a browser], we're interested again," Carr said.

"Platinum users need to pay attention to what's going on and make sure [ASG] delivers on the product," Clark said.

Do Your Homework

Before buying, potential users should check a company's development plans to determine which will make the enhancements they're most interested in, Blechar said — and that may not be the largest vendor.

A large company like CA has greater resources for development, he said, but "sometimes smaller companies like ASG can be better focused."

Ron Sprunger, data center manager at J. M. Smucker Co. in Orrville, Ohio, just wants to ensure that support for the Platinum tools continues for the next three years. Then, "we'll be off the mainframe entirely and onto a distributed system," he said.

ASG plans to acquire four more companies or products this year, said Avalone. One deal, scheduled to close today, would involve a "legacy workbench" and a product that would work with Platinum's Zeke, a mainframe job scheduler, he said. The other acquisitions will happen by the summer and send ASG's 2000 revenue to $150 million, he predicted. ▶

Six Divested Tools

Platinum/Allen Systems Group	Computer Associates
JOB SCHEDULING	
AutoSys/Zeke for VSE	CA-FAQS/PCS, CA-Scheduler (VSE)
AutoSys/Zeke for MVS	CA-7, CA-Jobtrac, CA-Scheduler (MVS)
TAPE MANAGEMENT	
AutoMedia/Zara for MVS	CA-1 and CA-Dynam/TLMS
AUTOMATED SYSTEMS OPERATION	
AutoAction/Zack for VSE	FAQS/ASO
JOB RERUN AND TRACKING	
AutoRerun/Zebb for MVS	CA-11
SOFTWARE LIFE CYCLE MANAGEMENT	
CCC/LifeCycle Manager	CA-Endevor

TECHNOLOGY

Apple's iBook: Flashy, Powerful, Inexpensive

Boasts long battery life and wireless links

BY TOM THOMPSON

Apple Computer Inc. touts the iBook, its new consumer-class Macintosh notebook computer, as an "iMac to go." It certainly looks the part: Its clamshell case sports colored panels in either a bright peacock blue ("blueberry") or an incandescent orange ("tangerine"). The computer has interesting curves and angles that make it resemble an experimental hypersonic airfoil.

PRODUCT REVIEW

To help you carry its 6.6-lb. weight, what appears to be a colored rim built into the hinge assembly pivots out to become a carrying handle. Much of the machine's bulk is due to its large lithium-ion battery, which the company claims provides six hours of battery life.

When you pick up the computer, you notice that the panels on the lid are rubberized, which provides a better grip. I've griped about the breakage-prone latch on the PowerBook G3 series. The iBook's engineers solved this problem by eliminating the thing: The lid simply flips up, exposing the keyboard and screen.

The iBook sports a full-size keyboard with a row of function keys and a silver trackpad. The lid houses a 12.1-in. thin-film transistor active-matrix screen with a resolution of 800 by 600 pixels.

An ATI Technologies Inc. Rage Mobility graphics application specific integrated circuit has 4M bytes of on-chip Video RAM and accelerates 2-D and 3-D graphics. The iBook uses a fast 66-MHz Accelerated Graphics Port bus to communicate with the ATI chip, and it also serves as a fast conduit to main memory for storing extra graphics data.

Internally, the system packs a 300-MHz PowerPC 750 (G3) processor and a 150-MHz backside L2 cache that consists of 512K bytes of fast static RAM. There's 32M bytes of synchronous dynamic RAM built in, with one Small Outline-DIMM socket for expanding memory. For mass storage, the iBook has a 3.2G-byte hard drive using an Ultra Enhanced Integrated Drive Electronics interface, and a 24x CD-ROM drive.

To handle communications, the iBook has an internal 56K bit/sec. modem, a 10BaseT/-100BaseTX RJ-45 Ethernet port. There's also one Universal Serial Bus (USB) port for attaching peripherals and a stereo sound output jack.

The iBook introduces novel wireless connections via the AirPort. The iBook's lid has two antennae built in, and an optional add-in card manages the required data processing and generation of radio frequency signals. The AirPort technology is based on the IEEE 802.11 standard for wireless communications and uses direct-sequence spread-spectrum modulation.

A properly equipped iBook can converse with an AirPort base station connected to a network or to another iBook. Other computers and devices that use these wireless standards should also be able to communicate with the iBook.

Needed: More RAM

The review unit came with the basic 32M bytes. Because Mac OS 8.6 requires about 18M bytes of memory to operate, that doesn't give you much room to run applications. The iBook spent a lot of time flogging the hard drive as the virtual memory subsystem ran, which made the system feel sluggish and did nothing for battery life. However, I used

the machine on a 2 1/2-hour business trip and even with the disk thrashing, the iBook had battery capacity to spare.

Later, I added a 32M-byte memory module. It takes about five minutes to pop out the keyboard, remove two screws from a metal plate with a jeweler's screwdriver and snap in the DIMM. With 64M bytes, the iBook became a new machine — very responsive and snappy.

The iBook's screen is crisp and bright, usable even outside on a clear day. However, direct sunlight on the display causes the anti-glare coating to fog up, so you do have to watch your position outdoors. The screen's resolution is fine for Web browsing but might seem cramped to someone used to bigger screens.

One Lone Speaker

For a consumer-oriented machine, the iBook has some odd omissions. It has a lone built-in speaker, so there's no stereo sound when playing games or audio CDs. The stereo sound jack lets you connect the computer to external speakers, but this flies in the face of the iBook's portability. The CD-ROM bay isn't removable, so there's no option to swap it for a DVD drive, as you can on other PowerBooks.

The iBook has a few expansion ports: no SCSI port, no video out, no PC Card slots and no infrared port. Fortunately, there are many USB peripherals, such as color scanners and hard drives, available.

The iBook makes a surprisingly handy, self-contained business system for the home office or road warrior. The hard drive's size might seem puny for someone downloading MP3 music files or lots of digital images. But I could pack all of my Motorola and Intel processor manuals on it, as well as my workhorse applications and a Connectix Virtual PC emulator application with a 750M-byte partition file, and still have 500M bytes to spare.

Whether I'm visiting a client company or corporate headquarters, an iBook, a phone and

a network connection are all I need to work. The iBook lets me do everything: send and receive faxes (with the bundled FaxSTF software), handle e-mails, write documents, run the occasional Windows program, download and read reference manuals and draw graphics for technical papers.

The Pretty Good Privacy encryption plug-ins worked flawlessly with my Eudora Pro e-mail application, so I could send and receive secure messages. The high-speed 100Base-TX Ethernet interface let me download a 26M-byte update in just a minute and a half. While I was at it, I snatched the compressed CD image of Mac OS 9 — 161M bytes — in a half-hour. Your mileage will vary due to Internet traffic and the Web server's capacity.

When I had to download a fresh copy of a VBScript host program to 17 Windows NT machines for a training session, I simply e-mailed myself the zipped archive from the iBook to a browser-based

e-mail service. On the Windows machines, I retrieved the program from the mail service and installed it.

Although I didn't need a floppy drive for this situation, a USB-based floppy or Zip drive to shuttle files about might be handy where Internet access isn't available. Wireless data transfers at 11M bit/sec. will be possible when the AirPort technology becomes widely available.

Unless you require a lot of peripherals, the iBook makes an ideal mobile business system. It has good processing power, a high-speed Ethernet interface and a built-in modem. I didn't scientifically evaluate the battery life, but based on my experience with the system, Apple's claim seems credible. The integral wireless technology will create new ways to conduct business. ▶

Thompson is a senior training specialist at Metrowerks Inc. in Hollis, N.H. You can reach him at thompson@metrowerks.com.

WITH FEATURES LIKE good processing power and a built-in modem, the new iBook is an ideal mobile business system

AT A GLANCE

Apple iBook

CPU: 300-MHz G3

RAM: 64M bytes

Hard disk: 3.2G bytes

CD, DVD: CD

Screen: 12.1 in.

Weight: 6.6 lb.

Price: $1,729

Overall grade: B

Pros: Long battery life; wireless capability looks promising

Cons: Few expansion ports; small hard disk

Laptops: The Princes and The Pauper

BY CHRISTOPHER LINDQUIST

SPEND A LITTLE. SPEND A LOT. Sometimes you don't have any leeway for how much you can afford to pay for your laptops. But whether this year's budget has room for the latest portable power tool or a merely serviceable model, you have plenty of options.

The gap between prices on the high and low ends of the laptop spectrum is growing ever wider. Inexpensive notebooks with all the power you need for on-the-road chores start at less than $1,500, while ruggedized portables for hard use and high-end multimedia systems with huge hard drives, docking stations, and gigantic screens can run $5,000 or more. It's all a matter of what you need to do and how much you want to spend.

Want a full-featured notebook computer for around $1,400? You can get one — if you're willing to accept some trade-offs. Laptops in this price range don't include DVD-ROM drives, huge screens or the fastest processors. And they usually aren't the slimmest, lightest models around, either.

station and more. This device can do everything your desktop system can, plus you can tuck it under your arm and carry it home or out on the road.

Once you enter superexpensive territory, you have other options as well. This category includes Tadpole-RDI Inc.'s Ultrabook — a SPARC-based Unix workstation in notebook form. Money can even buy laptop security for the overly clumsy. Itronix X-C 6250 Pro is built to take abuse. It's ruggedized and waterproofed, so you can drop it, step on it or even leave it out in the rain without worrying. But it will cost you — $4,995 for a base model.

Computerworld gathered three portable systems with street prices ranging from $1,400 to $4,995 to see what it could really get for the money. ▶

But if all you need is a solid system for cruising the Web, sending e-mail and writing reports — one that doesn't need to fit in your hip pocket — any of these portables can do the job.

For $3,500 or more, you can get a system with all the toys, including the latest Pentium III mobile chip, loads of RAM, a hard drive of 10G bytes or more, a 15-in. active-matrix screen, 3-D graphics acceleration, built-in Ethernet, docking

Lindquist is a freelance writer and reviewer in Moss Beach, Calif.

TravelMate 512T

Acer America Corp.
www.acer.com
$1,400

If you're on a serious budget, you won't be able to buy the thinnest, lightest or most powerful laptop on the market. But you will be able to buy a modest system – such as the Acer TravelMate 512T – that comes with just about everything you could need built-in.

The 512T gets its horsepower from a 366-MHz Celeron processor – not exactly cutting edge, but more than sufficient for most business tasks like word processing and Web cruising. The 32M bytes of RAM is a bit more of a concern, as it will slow you down when running multiple applications, but it does keep this system's price low. The same is true for the system's 12.1-in. active-matrix

Acer TravelMate 512T

display. It's plenty big for most work.

Acer rounds out the system with a 4.1G-byte hard drive, a 24-speed CD-ROM, a V.90 modem and a floppy disk drive, giving you all the tools necessary for getting work done at home or on the road. And you can find it all for less than $1,400.

Solo 9300cx

Gateway Inc.
www.gw2k.com
$3,999

Gateway's Solo 9300cx is one of the first systems to use Intel Corp.'s new generation of Mobile Pentium III processors, so it's not surprising that it's a pricey machine. But your money buys you a lot of processing muscle.

The 9300cx packs in a 500-MHz Pentium III processor, 128M bytes of

Gateway Solo 9300cx

RAM, a huge 18G-byte hard drive, a bright 15-in. active-matrix display, a high-speed graphics adapter with 8M bytes of RAM and a DVD-ROM drive into a box that weighs just less than 8 lb.

Although it's less than 1.7-in. thick, the 9300cx isn't a midget. The case measures almost 13 in. wide and just over 10 in. deep, making it a tight fit for a briefcase. But all that size provides plenty of room for the 9300cx's comfortable keyboard.

Toss in a SuperDrive 120M-byte floppy disk drive, a V.90 modem, an IEEE 1394 (FireWire) digital video connector and a port replicator (which includes ports for importing and exporting video and playing digital audio), and you have a complete portable system that just might outperform your old desktop.

X-C 6250 Pro

Itronix Corp.
www.itronix.com
$4,995 (volume pricing available)

If your field crew tends to leave a trail of dead laptops in its wake, maybe you should give them Itronix X-C 6250 Pros.

This system was designed for abuse, with rubber bumpers protecting the impact-resistant case, waterproof covers over all the ports and a comfortable, heavy-duty handle. It

Itronix X-C 6250 Pro

can run in temperatures ranging from 4 below to 140 above zero. And it survived several 3-ft. drops onto our office floor – while up and running – without a hiccup or dent. The small but serviceable keyboard even glows in the dark, making it possible to compute in the middle of a power-killing monsoon. If you don't want to use the keyboard, you can control things with the touch screen instead.

You don't get the latest processors for your money: Our test unit had a 266-MHz Cyrix CPU. And at 7 lb., the system is heavy for its compact 10.5-by-7.5-by-3-in. size. But sometimes reliability is more critical than performance and weight. If that's your situation, the X-C 6250 Pro is more than suited to the job.

What to Expect:

SUPERCHEAP ($1,500 and less)
Screen: Smaller active-matrix (sometimes called thin film transistor or passive display)
Processor: 333-MHz or similar Intel Celeron or Advanced Micro Devices Inc. K6-2 CPU
Memory: 32M bytes is most common; some models have 64M bytes as a standard
Graphics: Basic 2M bytes of integrated graphics
Drives: 4G-byte or similar hard drive, CD-ROM and floppy drives
Weight: 7 to 8 lb. on average
Standard features: V.90 modem, lithium ion battery

SUPEREXPENSIVE ($3,500 plus)
Screen: Large (up to 15.1-in.) active-matrix display
Processor: 500-MHz Intel Mobile Pentium III processor
Memory: 64M to 128M bytes
Graphics: 3-D accelerator with 8M bytes of RAM
Drives: 10G-byte or larger hard drive, DVD-ROM drive, floppy drive (possibly 120M-byte Superfloppy)
Weight: Varies by notebook style, from less than 3 lb. to more than 8
Standard features: V.90 modem, 10/100M-bit Ethernet adapter, DVD movie acceleration
Extras: Docking station, extra-rugged case, wireless connectivity, Unix workstation

TECHNOLOGY QUICKSTUDY

HOT TRENDS & TECHNOLOGIES IN BRIEF

Asynchronous Transfer Mode

BY CARLA CATALANO

FOR MANY Fortune 1,000 companies, the choice of Asynchronous Transfer Mode (ATM) as the underlying transport service for their wide-area networks (WAN) is akin to the choice of cable service over rabbit ears on a television set. ATM handles many different types of data, including voice and video, on a single network. Thus, large companies generally use ATM for their WANs, says Lisa Pierce, an analyst at Giga Information Group Inc. in Cambridge, Mass.

One reason ATM works well with disparate kinds of data is that it's connection-oriented. A sender and receiver on a network set up a fixed path between each other before sending data, and the information arrives in the order it was sent.

Other protocols, such as TCP/IP, are connectionless. That is, they don't have fixed connections, so individual data packets may go to different destinations and they may be delayed or arrive in the wrong order.

Optimal for Real-Time Use
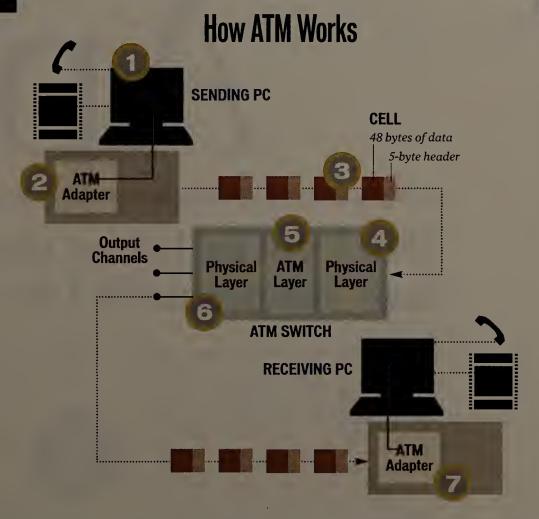
Fixed-route transmission is what makes ATM optimal for real-time communication like voice and video, says Lawrence Orans, an analyst at Gartner Group Inc., in Stamford, Conn. With proper tuning, the quality of voice traffic will equal telephone quality, and video traffic will mirror cable television, says Orans. It's also easier to track and bill network usage.

An ATM network transfers data in 53-byte cells. Cell size never varies, and cells with the same source, destination and class of service parameters (see "Four Types of ATM Service") always follow the same path, as long as that path meets performance criteria. To deal with congestion or network failure, there are also pre-established secondary routes.

Real-time data takes precedence over non-real-time data on an ATM network. For exam-

DEFINITION

Asynchronous Transfer Mode (ATM) is a high-speed networking technology that supports voice, data and video. Used to ensure quality data transmission, an ATM network prioritizes traffic, guarantees business-quality voice and video throughput and makes it easier to track data usage across the network. ATM service can be purchased through a telecommunications company.

How ATM Works

SENDING PC

CELL
48 bytes of data
5-byte header

ATM Adapter

Output Channels

Physical Layer　**ATM Layer**　**Physical Layer**

ATM SWITCH

RECEIVING PC

ATM Adapter

1. The sender's PC has an ATM adapter. It may also have telephone (voice) and digital video sources connected.

2. ATM adapter takes a digital signal, converts it to cells in the ATM layer and sends them via the physical layer across the network to the ATM switch.

3. Each cell contains 48 bytes of data and a 5-byte header containing routing and quality-of-service information. This fixed length lets ATM operate very efficiently with minimal overhead.

4. Inside the ATM switch, incoming cells are processed using both

physical and ATM layer information to determine their destination and what type of service they need.

5. The switch's ATM layer sends the cell to the appropriate outgoing connection – high-bandwidth for real-time delivery of video or voice.

6. The switch's physical layer prepares the cell for the chosen transmission method and sends it on.

7. At the recipient's PC, the ATM adapter receives the signal, strips off the header and sends it to the appropriate output device – screen, speaker, phone or data file.

But while ATM seems to be the perfect answer for WANs, many large companies are more likely to use a hybrid approach, such as Gigabit Ethernet over ATM, on LANs.

Piling another protocol on top of ATM may slow it down, but there's an advantage: Information technology staff is typically already trained and comfortable with Ethernet, says Esmeralda Silva, an analyst at International Data Corp. in Framingham, Mass. "It's easier to continue using a familiar technology than to learn a new one," she adds. ATM is also less necessary in LANs, which typically don't carry much real-time data, she adds.

ATM is also expensive. On networks where users don't do much videoconferencing, a cheaper approach makes sense, says Pierce. ▶

Catalano is a freelance writer in Holliston, Mass.

JUST THE FACTS

Four Types of ATM Service

For wide-area networks, ATM is a business service offered through telecommunications companies. When subscribing to an ATM service, companies have four choices for class of service, which are listed here from most to least expensive:

Constant bit rate (CBR) service: Emulates a private line. Data is sent in a steady stream with the lowest latency. Used for voice and video transfer. CBR is the most expensive service and the best guarantee for high quality.

Variable bit rate (VBR): As the name suggests, data speed may vary compared with CBR. But if CBR is too expensive, real-time VBR may be a workable alternative for voice and video. Non-real-time VBR is a higher class of service for things like e-mail or file transfer.

Available bit rate (ABR): Best used with data that isn't critical, such as file transfer. ABR isn't for voice or video unless users can tolerate delays and a lower quality video image.

Unspecified bit rate: Used for data files like e-mail, that aren't time-sensitive. Doesn't guarantee throughput levels.

ple, if voice and e-mail traffic are sent simultaneously, the switch grabs the voice traffic before grabbing the e-mail.

In addition, the small, constant cell size enables data to

be forwarded through the network more efficiently. Frame relay and other connection-oriented protocols transfer data in packets of varying lengths, which makes for vari-

able delays between packet transfers, Orans explains. With ATM, those delays are eliminated, because the switch is "always looking for 53-byte chunks," Orans says.

■ *Are there technologies or issues you would like to learn about in QuickStudy? Please send your ideas to quickstudy@computerworld.com.*

Webifying Mainframe Apps

Lessons from the Field

Watch out for hidden costs, both in tools and people By Lee Copeland

OT EVERYONE loves reworking Cobol applications. Angelo Serra certainly doesn't. "It was hell," says the systems supervisor at the Ohio Department of Transportation, as he describes his work adding a Java interface to a Cobol time-management system. "People can draw neat diagrams [describing the process], but it wasn't easy."

Serra isn't alone in running into problems crafting fixes and interfaces to extend the life and reach of Cobol applications. To save time and leverage existing software and labor assets, a number of companies are opening up their Cobol programs to PCs, Web browsers and other client devices, using internal networks and the Web.

"A lot of companies are running on borrowed time" in their rush to webify mainframe applications, says Charlie Burns, a vice president at research firm Giga Information Group Inc. in Cambridge, Mass. Year 2000 concerns "forced them to document their code and do an inventory on linkages. And in doing so, they realized their Cobol applications were not fixed but reusable assets."

But dusting off old Cobol applications for new levels of client access can involve unexpected difficulties and costs. Veteran developers and analysts recommend investing time up front to address the complexities of adding Web servers to mainframe environments, deciding where best to place the business logic within the application infrastructure and calculating the costs and availability of tools to do the job.

1 The Search for Tools

Developers say making over their old Cobol applications with a new interface costs much less than starting from scratch. However, you still need to factor in time spent finding the right tools to finish the job and the costs of the tools themselves. These costs, as well as those for labor, can quickly drive up the overall price tag.

Midway through a project to put a Windows interface on a Cobol printing application, developer Bill Kooistra at Poorman-Douglas Corp. in Beaverton, Ore., realized he needed to simulate the batch commands used in mainframes in a Windows environment.

"I started working on it but could not get all the pieces together," Kooistra says of the stalled project. "Mainframes process jobs in batches using a sequence of steps, but PCs do not use batch tools."

Kooistra wanted to create a PC network to access the Cobol application and use the same procedures in that application to extract, convert and sort data for printing bank statements and utility bills, which is the core of Poorman-Douglas' business.

He spent valuable time searching for a tool to

process batch commands in a Windows environment and eventually found WinBatch from Seattle-based Wilson WindowWare Inc., but the search put the project on hold. "You need to know what tools you need for the PC environment up front," he advises.

Complicating the issue is the fact that not all Cobol applications run on mainframes. For example, Todd Thomas, director of product development at Health Data Services Inc. in Cleveland, wanted to move his 10-year-old PC-based Cobol claims-processing applications, written for pre-Windows PCs and in non-ANSI-standard Cobol, to Windows. Thomas needed a precompiler to perform syntax conversions on the Cobol code, and rewriting the applications wasn't an option.

"I've got 3,000 programs full of legacy Cobol code that would have to be rewritten in another [language], and I have about 25 Cobol programmers with 425 years of experience on staff," Thomas says. "Our goal was to move to an object-oriented, Windows-based development platform while salvaging our legacy code and leveraging our existing [personnel] in Cobol."

Thomas faced two choices during the project's design phase: spend $20,000 and wait eight weeks for a custom-built precompiler from San Jose-based Fujitsu Software Corp. or build one in-house, an undertaking that would require several hundred man-hours. Thomas decided to buy the precompiler, because "even bigger than the man-hours spent would have been the cost to pull those guys off other projects," if it had been built in-house.

2 Mixing Web Servers With Mainframes

Including a Web server in a mainframe computing environment presents another set of challenges. Randy Kriz, president of Orbis Systems Inc., a consulting firm and developer of health care software in Ingleside, Ill., shopped long and hard to find an Internet service provider that would provide a Web server for his Cobol applications.

"If you have your own dedicated server it's not an issue, but some [Internet service providers] will not install a mainframe runtime environment on their servers," Kriz says. "A lot of ISPs are afraid because they don't have experience with mainframes. If your application locks up their computer, it locks up 75 other people too."

"Most mainframe people are used to being able to walk into the next room and check on their computer, but with an ISP, the Web server is down the block or across the country," Kriz adds.

Bill Kwelty, a customer information services manager at Automotive Resources International Inc. in Mount Laurel, N.J., says he went through "hurdles" finding a gateway for the fleet-management firm's Groupe Bull DPS7000 mainframe, and deciding whether to install the gateway on the Web server or on the mainframe.

"Developers should first decide whether the gateway resides on the Web server or mainframe. The Web server requires less resources to configure the gateway" than a mainframe, he says.

Kwelty needed the gateway to route data in real time from the Cobol fleet-management application to client machines. He crafted an interim solution, putting part of the gateway on the mainframe and part on the Web server, until an upgrade to French vendor Groupe Bull's Open7 gateway became available. By adding the gateway, Kwelty was able to keep his data synchronized so that it reflected both updates made internally to the mainframe and those made by customers using the Web.

His goal was to make it easier to execute real-time updates without slowing down processing for people using Web browsers and Java clients.

3 Finding a Home for the Business Logic

Another critical issue involves the business logic. Many legacy Cobol applications contain well-defined business rules for data entry, updates, queries and reports. Developers need to decide whether to keep this logic within the source code of Cobol applications or encapsulate the logic with the data using an object-oriented design structure. Most distributed client/server environments rely on the latter approach.

"In most Cobol programs, the business logic is fragmented and not kept attached to the related data," explains Brian Reithel, a computer sciences associate professor at the University of Mississippi in Oxford. "It's better to view the database as a repository for data." For example, an order-processing Cobol application may contain a business rule that requires customers with a certain quantity of orders to pay special shipment fees. If that obscure logic is hidden within a source file, an update to the application may not also update that rule.

Instead, Reithel suggests capturing the business logic in JavaScript within an HTML file or within the database interface using Open Database Connectivity (ODBC) drivers or Common Object Request Broker Architecture objects. This allows developers to quickly update the data and the business logic at the same time, without having to search through source files on the mainframe to find that logic.

Moving the business rules closer to the data also "sets the stage for migration away from a Cobol-centric model to standard interfaces, like ODBC, which sit between the Web client and the database in a distributed client/server model," Reithel adds.

Serra's team of developers spent nine months crafting a Java interface for the Ohio Department of Transportation's Cobol time-management application. Their two-tier architecture put the calculation work on the client machines, which accessed data on the mainframes. By putting the Java rules engine on the client, it took longer to process requests than if the business logic resided on a separate database.

"The business logic was being pumped down to the client side," says Serra. "If I could do it again, I would not have built a two-tier application . . . because it made the [application] a complete pig." Serra's group is rewriting the interface but plans to migrate away from the mainframe environment.

Cobol developers were divided on whether to continue executing the procedure code within Cobol programs or implement an object-oriented approach.

Frank Boyle, former deputy CIO at the U.S. Department of Agriculture's Agricultural Marketing Service in Washington, chose to process the business logic within his Cobol application when he recently revamped the agency's decades-old financial information system.

"One of the big advantages is reusing a lot of the business logic and not having to recode," Boyle says. "It takes a lot of time to get it right and to get the knowledge of how to handle the data. It took months of interviews with internal groups and testing to work out the business logic, so a lot of aggravation is saved if you save that logic."

However, Boyle says he might consider a different setup if designing a new system. "But it would have made our project four times as expensive if we had gone the other route" and replaced the business logic. ▶

> If I could do it again, I would not have built a two-tier application . . . because it made the [application] a complete pig.
>
> ANGELO SERRA, SYSTEMS SUPERVISOR, OHIO DEPARTMENT OF TRANSPORTATION

New Life for Old Cameras

Dimage scanner extends your investment in film photography
By Cynthia Morgan

GOING DIGITAL ain't all it's cracked up to be, especially if you're managing photographic assets.

Digital cameras are almost synonymous with the online world. Corporations use them for product shots in e-commerce catalogs, personnel photos, off-site assessments and a gazillion other things.

But the move to digital cameras isn't always smooth. Film cameras still offer the best value; even a disposable 35mm tops the resolution of all but the most expensive digital cameras. Most professional photographers today use conventional film cameras, and a company may be reluctant to duplicate perfectly good photo equipment with digital equivalents.

Bridge the Gap

Minolta Corp.'s Dimage Scan Dual digital film scanner can bridge the gap between digital and film photography. It offers higher resolution images — 2,438 dpi, or roughly 8 megapixels — than today's 2- to 3-megapixel digital cameras. It accepts 35mm negative or slide film; you'll need an Advanced Photo System adapter to scan those new films, however. And it's less expensive than most good-quality digital cameras.

The unit is easy to use with either Windows or Macintosh computers, works with every Twain-compliant graphics application I've thrown at it and consistently produces higher-quality images — black-and-white or color — than any under-$2,000 digital camera I've tried.

The Scan Dual requires a SCSI-2 interface that's sometimes tricky to install, but I had no problems. To use the Dimage unit, you insert 35mm negative strips or slides into the carrier and insert it into a keyed slot, then activate the scanning utility on your computer. It comes bundled with software to crop, retouch and publish images.

Its scanning driver/utility offers quite a bit of information about the scan and lets you do some pre-editing.

The Scan Dual completes the scan in about a minute; the length of time it takes for your computer to get the scan on-screen varies. In my case, with a Dell Computer Corp. Dimension with 128M bytes of RAM and a 500-MHz Pentium III, the Dimage machine took about three minutes per frame with either Adobe Systems Inc.'s PhotoShop or Microsoft Corp.'s PhotoDraw.

Drawbacks

Scanning film does have its, er, negatives. It takes longer than digital photography if only because the film must be developed before it's scanned. That won't matter if you're simply scanning existing negatives, but it could be a headache for new images. And the Scan Dual scans just one frame at a time, 35mm only, with no batch mode. If you want to scan a lot of images quickly, or use a different size of film, you'll need to buy a more expensive scanner.

The condition of your negatives or slides is especially important. You'll want to invest in an inexpensive soft brush and puffer to remove dust particles.

Ask your photo shop to slip your negatives into transparent sleeves so you won't have to handle the negatives directly. If not, you'll have trouble wrestling curled-up negative strips into the carrier accurately without damaging them.

At 2,438 dpi, the Dimage Scan Dual's scans aren't the equal of professional graphic arts scanners (which can reach 12,500 dpi). But they're more than adequate for most corporate needs, and a welcome bridge from film to digital photography. ▶

Epson Photo Stylus 1200

Epson America Inc.
(800) 463-7766
*www.epson.com/printer/
inkjet/styphoto1200/*
List: $499
Online: $380

Epson's Photo Stylus 1200 is almost the perfect office photo shop; it prints up to banner-size photographs of exceptional quality at a more than reasonable price.

It's an ink-jet printer, but its output looks photographic to casual observers. The 1200 uses tiny 6-picoliter ink droplets to give resolutions of 1,440 by 720 dpi with six colors of ink. It prints up to Super B-size (13 by 19 in.) normally; with the optional paper roll holder it can print banners that are 13 in. by 32 ft. And transparencies look good even when they're projected across a large room.

One 8-by-10-in. photo took about two and a half minutes to print. I ran through about 60 full-size 8-by-10 photos on a single color cartridge, about 83 cents per print. Given the $10 or so you'll pay at a photo shop for an 8-by-10 enlargement, this printer soon pays for itself. It can serve as a standard printer, but the noise factor – it sounds like you're beating a donkey – may prevent that.

Its dual Universal Serial Bus/parallel port interfaces make it easy to set up, and on-screen guides control most of the maintenance and troubleshooting. The 1200 should be an automatic consideration for any office that needs fast, high-quality signs or photographs.
     – Cynthia Morgan

COMPARE THE SCANS

This 2,438-dpi scan of a 35mm color negative (left) looks surprisingly good, even when it's magnified 1,000% (inset)

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BUSINESS WITHOUT INTERRUPTION: **VERITAS**

NetVision Gets Directories Talking

Start-up's Synchronicity software helps ease multiplatform problems

BY AMY HELEN JOHNSON

USERS AND network security procedures aren't exactly a match made in heaven. That's one reason directory synchronization and start-ups that provide it, like NetVision Technologies Inc., are such hot commodities.

Consider the situation at Commerce Bancshares Inc., a Midwestern bank chain based in Kansas City, Mo. The company's 5,000 employees were forced to change pass-words on two networks every other month. Most wanted the same password on the bank's Windows NT and Novell networks, but they weren't sure how to do that. While they were trying to figure it out, the network security systems would lock them out.

So they called the help desk. And called again, 60 days later.

The job of figuring out how to solve the problem of the idle users and overwhelmed help desk staff fell to lead network engineer Steve Marble. He discovered the difficulty wasn't in training users how to change passwords as much as it was in getting them to understand they needed to do it twice — once for each system.

Lines of Communication

Marble's solution was to make only one password necessary. In May, he installed directory synchronization software, which lets users pick one password and have that change propagated throughout Commerce Bancshare's multiple networks. As a bonus, his network administrators' jobs got easier because they were able to manage both networks from one interface.

The directory synchronization software Marble chose was Synchronicity from Net-Vision in Orem, Utah. Net-Vision has two main products:

DirectoryAlert, a real-time security monitor of network directory changes, and Synchronicity, an administration tool that coordinates directory information among Windows NT, NetWare 3, Novell Directory Services (NDS), Microsoft Exchange, Lotus Notes and Active Directory networks.

According to NetVision CEO Todd Lawson, the key technology for Synchronicity and DirectoryAlert is a patented monitor called Global Event Service, which picks up any changes that occur within the directories under its supervision. Those changes are spread to directories, or a network administrator is notified.

NetVision doesn't take a metadirectory approach, Law-

NETVISION FOUNDER AND CEO TODD LAWSON: "We want to remain directory-agnostic"

NetVision

Location: 563 East 770 North Orem, Utah 84097

Telephone: (801) 764-0400

Web: *www.netvision.com*

Niche: Network directory synchronization and security.

Why it's worth watching: One point of administration for multiple directory services increases efficiency and reduces errors.

Products: Synchronicity, DirectoryAlert.

Company officer: Todd Lawson, CEO and founder

Milestones:
• 1996: Founded; first product, Synchronicity, introduced.
• March 1999: Synchronicity 2 launched
• August 1999: Debut of Directory-Alert

Employees: 30; 20% growth per year.

Profitability: Profitable since 1997.

Burn money: The founders and anonymous donors contributed seed money, plus $2 million from Novell.

Customers: Commerce Banc-shares, Asante Health Service, National City Corp., Culinary Institute of America and Mortgage Management Corp.

Major successes: Signed 100-site contract with National City Corp. in October.

Red flags for IT:
• If you're a single-vendor shop of Windows NT or NetWare, you won't have much use for Synchronicity.
• The number and type of directory sources is growing, especially from ERP and back-office application vendors. Net-Vision may have trouble adding support for these directories quickly enough.

son says. All the data is kept native in the directories, and administrators can use familiar tools bundled with the directories to manage those assets.

NetVision's Niche

NetVision has found a sweet spot in the market: a way to reduce the workload faced by network administrators who manage multiple directories, says Richard Villars, an analyst at International Data Corp. in Framingham, Mass. "NetVision is incredibly attractive to a lot of internal IS managers who are reaching the wall with the integration of their existing e-mail and user administration tasks in the NT and the Net-Ware world," he says.

However, Villars warns that sitting in a sweet spot doesn't make NetVision a cornerstone of network infrastructure. The firm has to increase its partnerships. NetVision's products work with those from Microsoft Corp., Novell Inc. and Lotus Development Corp., but eventually it will need to expand its relationships with vendors of other enterprise software applications, Villars says.

NetVision plans to do that. Lawson says he's looking at supporting directories from America Online Inc. and Netscape Communications Corp., as well as directories for Unix servers and enterprise resource planning (ERP) systems. "We want to remain directory-agnostic," he says.

NetVision's neutral approach gives it the broadest possible market. But if the directory landscape consolidates, Net-Vision will see its market dry up, regardless of whether it remains neutral.

"If everyone were using one directory, Synchronicity would have no more value," Lawson acknowledges.

Villars says he sees some signs of that. Microsoft's Active Directory will have metadirectory capabilities, and Novell has been expanding its NDS line. But counterbalancing that is a set of directories associated with enterprise applications. "The number of data sources is growing," says Villars, which bodes well for NetVision's niche. ▶

Johnson is a Computerworld contributor.

The Big Deal About Directories

A directory is just a specialized form of a database, so you might wonder why there's all the fuss about updating directories. Changing the information stored in a database is simple. But the problem isn't so much changing data as it is ensuring that the data is the same from directory to directory.

Richard Villars, an analyst at International Data Corp., identifies the following ways to achieve synchronization among directories:

Direct Links

You can create a link directly between two directories or between a directory and an application that exchanges information with the directory. Villars says the problem with this is you have to create separate links among all the directories and applications that need to communicate, so the solution becomes increasing complex as you add directories. Such links are subject to strict guidelines, so they're unforgiving of errors.

Metadirectories

The metadirectory approach creates an intermediary between the two directories. This configuration allows you to add directories to the architecture with relative ease because you only have to create one additional link – between the new directory and the metadirectory – to bring the information online.

Using the synchronization method, like NetVision does, allows all the information to stay in the working directories. Synchronization doesn't move the information to yet another place, like a metadirectory does. Think of it as a clearinghouse, shuttling information among all the directories in response to a change in one. You can even opt for a batch approach using this method.

Same Language(s)

One school of thought is that if all directories used a common format, then exchanging information would be much simpler. Villars says he agrees but points out that something is still needed to synchronize the information among the directories – a piece of software that contains processing logic that defines how to update the remainder of the directories when the information in one changes. So a common format makes communication among directories simpler, but it doesn't end the need for that communication. *– Amy Helen Johnson*

MARKETPLACE

Web Evangelists

In the continuously evolving world of the Internet, there are plenty of opportunities to create a role – and a title – of your own making By Bronwyn Fryer

Who: Tom Linde

Company: Aquent, an information technology recruiting company in Boston

Title: Web evangelist

Previous title: Area manager at Aquent

Reports to: Vice president of strategy

Skills for job: As Web evangelist, he's an Internet strategist who drives and promotes his company's electronic business and strategy. He's also a creative yet technical person who serves as an "early-warning radar system" for corporate Web strategy. Linde's title, he says, "was initially a placeholder for the position based on breadth of skills required. We also wanted to [address] the proselytizing aspects of the position. The title actually works well as an icebreaker." In a day, Linde usually calls upon all of the following skills:

■ **Communication:** The ability to serve as a single voice of clarity in a confusing world, to sell an idea and to set up partnering arrangements with external companies.

■ **Scope:** The ability to take a broad view of new Internet-related business opportunities and technologies.

■ **Technology development:** Experience in seeking out, evaluating and recommending technology solutions.

■ **Project management:** Dealing with budgeting, scheduling and resource allocation.

REX RYSTEDT

AQUENT'S TOM LINDE says Web evangelists are professional prognosticators and must be willing to take the heat if they make a mistake

GOT WEB SKILLS? You needn't settle for the dreary title of webmaster. These days, people with Net-related skills can call themselves just about anything they want. Think of it as just another perk.

According to Cleveland-based executive search firm Christian & Timbers, people who plan, build or maintain corporate Web sites can take their pick of titles. The company says people with Internet-related jobs carry titles like vice president, online community; online liaison (someone who responds to e-mail requests); code connoisseur (a programmer); or minister of propaganda and virtual space planner (designer of interfaces).

Here, we explore the inner workings of one particular emerging title — Web evangelist — with someone who has it inscribed on his business card.

Temperament: In addition to juggling all of the above, a Web evangelist needs to be what Aquent's Tom Linde calls "combination-brained," or able to be both rational and creative at the same time. Linde describes this as "an internal balancing mechanism that allows me to analyze issues and communicate well with people from all different backgrounds."

Linde says his position is a culmination of all his career experiences in multimedia graphic design, art direction, and project and technology management. "Having to seek out, evaluate and recommend technology solutions helped me develop a discerning eye for what's good and why it's worth the investment," he says.

Biggest challenges: Living on Internet time is one challenge. Web evangelists must analyze business models and strategies that are in a constant state of flux. "The toughest challenge is staying on top of change in the environment as a whole and making sure you stay in tune with your company's goals at the same time," Linde says.

Being comfortable with one's own fallibility is also challenging. Web evangelists are professional prognosticators, and they occasionally guess wrong and have to take the heat. "Can you admit that you don't know or can't predict an outcome with certainty? Or that you've made a mistake? Being able to do that takes internal strength. In a position where you're expected to be the voice of knowledge and certainty, that's not always easy to do," Linde says.

Biggest break: Linde gets to work with people and has "a significant impact on the business outcome" of his organization.

Lessons learned: Linde says, "Predicting which emerging technology will take hold in the marketplace is like trying to time the stock market. You'll lose as often as you win." With this in mind, he advises Web evangelist wanna-bes to resist technology's bleeding edge. "What if that newfangled technology that you've succumbed to integrating into the product never catches on?" he says. Likewise, Linde advises doing a post-mortem on every project to learn from it. "Keep a summary of lessons learned from past development projects, and keep them as a historical document for future ones," he insists.

Outlook for career: Linde says he isn't sure how this wet-behind-the-ears position will change over time, but, he says, with enough experience, Web evangelists can move in several directions. "Some will follow the CIO or CTO track," he predicts. "Some will move into external consulting, either in the technology or the creative and marketing field. Some have the entrepreneurial bug and will start companies." ▶

Fryer is a freelance writer in Santa Cruz, Calif.

Just the Facts

The title *evangelist* comes from the old days at Apple Computer Inc., where staffers carried unusual titles. Guy Kawasaki, a venture capitalist at Palo Alto, Calif.-based Garage.com, was formerly Apple's most vocal evangelist.

A corporate Web evangelist wears several hats: IT manager, promoter, strategic analyst, negotiator and traffic cop. But as the demand for people with a bird's-eye view of Internet development increases, those parts merge into a career in high-level management, consulting or entrepreneurism.

Driving Forces

There are three forces driving the need for Web evangelists, according to Tom Linde, a Web evangelist at Aquent in Boston:

■ The extremely rapid pace of change on the Web and e-commerce.

■ The need for strategic thinkers with broad business, communication and technology skills.

■ The need for dedicated advisers to guide Web and partnering opportunities.

Career Potential

Web evangelism is still in diapers as a job description, but organizations are crying out for IT people with business skills and vice versa [see Skills Survey, Nov. 15, 1999]. "I do hear other organizations asking me about what I do because they think they need a Web evangelist as well," Linde says.

Salary Ranges

These vary, but salaries generally start in the $70,000 to $90,000 range and increase from there. As with other senior positions in the Internet arena, Web evangelists also receive stock options. Some will have flexible working schedules or work from home offices.

Personality Types

Linde says Web evangelists must have the following traits:

■ Be able to think with both the creative and analytical sides of your brain and to communicate easily with both techies and technophobes.

■ Be a people person – a good listener and an astute reader of others' thinking.

■ Be a good project manager with demonstrable strategic analysis skills.

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FRANK HAYES/FRANKLY SPEAKING

New Fears Day

READY FOR 2000? If you're reading this, printing presses, airplanes and postal carriers — or at least the Internet — survived Y2K zero hour well enough to get *Computerworld* to you. But if Y2K was our No. 1 problem for 1999, what's the issue that will dominate corporate IT in the coming year?

Lawyers.

Doesn't *sound* like an IT issue, does it? Oh, but it is. Think you've already wasted huge amounts of time on unnecessary Y2K paper-work? Wait till your legal department starts filing Y2K lawsuits. Corporate IT is the star witness here, bunky. Better be sure your Y2K and software development managers are in on this from Day One. Your first assignment: estimating the cost of gathering the necessary documentation to support the lawsuits — and whether that documentation even exists.

But it doesn't stop there. You'll be running more software contracts than ever past Legal, as states pass **UCITA**, the Uniform Computer Information Transactions Act. That's the one making shrinkwrap licenses binding — which means everything *you* install needs custom negotiation.

If orders come down for you to **snoop on user files, e-mail or Internet activity**, run, don't walk, to your legal eagles. Get clearance in writing, or both you and your company could end up in court. And get explicit written orders before **monkeying with any transaction data** at an executive's request "just to make the numbers cleaner" for a quarterly report. In a shareholder lawsuit, your head *will* roll.

Outside the IT shop, lawyers for Microsoft will battle valiantly to keep the company from being broken up. But the bigger fight will eventually be a **huge class-action suit** claiming that Microsoft overcharged for Windows. Think it won't touch IT? If Microsoft gets hit for a huge payout, the payees will be Microsoft's customers — that's us.

And you can expect more **lawsuits against enterprise software vendors and consultants**. It won't be pretty for plaintiffs, and lots of suits will be settled quickly. But expect at least one big consulting firm to take a hard hit in court this year for ERP work that just didn't measure up to its promises.

What are the problems that'll dominate IT in the coming year?

Other big IT issues for 2000? For **Windows 2000 and Linux**, the motto at most IT shops will be "you go first." **Y2K won't go away** — we'll still be putting out ever-smaller fires a year from now. Watch out for a new problem: IT shops that used windowing as a stopgap measure and now can't get the budget for a permanent Y2K fix. And 2000 will be the year some companies decide to try **cutting e-commerce costs**, which will raise the pressure on IT to deliver clean, working e-commerce systems that sell the goods.

Road computing gets serious this year as wireless handhelds hit the mainstream for outside salespeople. They'll want data in real time to close the deal. Better pray your ERP vendor comes up with a Palm interface — and fast.
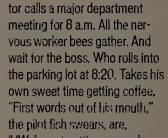
PCs will get cheaper, but don't count on slashing your desktop hardware budget yet. **Flat-panel displays** should be your next target. Users love 'em, but they're not just status symbols — they're also ergonomically better than CRTs and give users their desks back to boot.

Mini-outsourcing will make small projects cost effective to outsource in 2000. Brokers will handle everything, including project management, so you don't have to. And software vendors are rewriting their applications to be more **rental-friendly**, so that could finally kick in this year.

Finally, plan on **daily antivirus updates for your firewall**. It's an ugly world out there. But, hey, maybe by the end of 2000 we'll be hit by a virus-writing hacker rich enough that it's finally worth feeding him to — who else? — the lawyers. ▶

Hayes, Computerworld's staff columnist, has covered IT for more than 20 years. His e-mail address is frank_hayes@computerworld.com.

The 5th Wave

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